Titel der Arbeit:
**The Water Crisis in the Greek Island Complex of the Cyclades: Diagnosis, Analysis, and Rectification**

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## Summary

This study aims at diagnosing the dysfunctional water sector of Tinos and Syros, islands in the Cyclades island complex of Greece. At present, these islands suffer from insufficient water quantity, combined with poor quality and high cost. The research problem addressed in this thesis is the apparent inability of centrally planned technical and administrative-reform solutions that have been promoted to rectify the problems. This work explores the reasons for the inability to rectify the water sector and aims to answer the overarching research question: Why is the water sector in the Cyclades still dysfunctional, despite the attempted solutions?

In answering this question, I have laid particular focus on the institutional rather than the physical dimensions of the problem, using an adbuctive research strategy to guide the research process. First, I investigate the main concepts employed here: *water sector*, *Cyclades islands*, *dysfunction* and *responses*. Building on institutionalist theory, I come to two conclusions, suggesting the existence of a vicious circle: i) institutions and policies have led to this chronic dysfunction, manifested as disrupted and insecure water provision and ii) the same dysfunction (scarcity) itself acts as a driver for those institutions to change.

Second, I address the question of how can such a vicious cycle be broken? At which point in the process should interventions occur that can positively alter outcomes? To this end, I explore potential theoretical foundations upon which to ground the analysis of possible rectification for the water sector in Tinos and Syros, resulting in the identification of several factors that could help us to explain the dysfunction. In this vein, I examine the effect of insularity on the ability of administrators to set up and implement policies safeguarding water resources in this type of environment. Then, I approach the question from the perspective of size. Can small local administrations deliver policies and intervene in a meaningful and effectual manner? What happens if an administration is both insular and small?

To explore these emergent questions related to policy making, I revisit existing legal rules and relations relevant to the context, viewed in parallel with aspects of human behaviour and transactions under the analytical lens classical institutional economics offers. The reasons for the water-supply dysfunction in the study islands are, thus, sought after in terms of transactions amongst actors, working rules regulating those transactions, and officials' remedial power at all levels. Based on my analysis, I conclude that top-down structures and centrally planned policies have been hindering the meaningful change and rectification of the water sector and have, in fact, created and prolonged the dysfunction. Decentralising governance, granting local-level autonomy (institutional and financial) is a plausible way of rectifying the water sector, as local officials are knowledgeable about local conditions and feel liable to their fellow citizens, who would willingly cooperate with this level of government.

# Zusammenfassung

Das vorliegende Buch hat die Analyse des funktionsgestörten Wassersektors auf den beiden Zykladen Inseln Tinos und Syros in Griechenland zum Ziel. Die Bevölkerung dieser Inseln leidet unter einer Kombination aus mangelnder Wasserqualität, -quantität und hohen Wasserpreisen. Die Arbeit setzt sich mit Gründen der Ineffektivität zentral geplanter Maßnahmen (technische Lösungen und administrative Reformen) bei der Lösung solcher Probleme auseinander. Die übergeordnete Forschungsfrage hierbei lautet: Warum ist der Wassersektor angesichts einer Vielzahl von Lösungsversuchen immer noch dysfunktional?
Um diese Frage zu beantworten, liegt der Fokus auf der institutionellen statt auf der physikalischen Dimension des Problems. Hierbei verfolgte ich eine abduktive Strategie innerhalb des Forschungsprozesses. Zu Beginn untersuche ich die zentralen Konzepte meiner Forschung: Wassersektor, Zykladen Inseln, Dysfunktion und Reaktion. Auf institutionentheoretischen Annahmen basierend, komme ich zu zwei Schlussfolgerungen, die einen Teufelskreis vermuten lassen: i) Institutionen und Politik haben zu einer chronischen Dysfunktionalität, die sich in einer unsteten und unsicheren Wasserversorgung äußert, geführt. ii) Diese Dysfunktionalität verhindert eine Veränderung der existierenden Institutionen.
Aufbauend auf diesem Zwischenfazit setze ich mich mit den Fragen auseinander, wie ein solcher Teufelskreis durchbrochen werden kann, und an welchem Punkt zu intervenieren ist, um die ungewollten Konsequenzen zu vermeiden. Hierfür untersuche ich potentielle theoretische Grundlagen für die Entwicklung möglicher Verbesserungsansätze der Situation auf Tinos und Syros. Diese Herausforderung mündet in der Identifikation verschiedener Faktoren, die helfen können, die Dysfunktionalität zu erklären. Weiterhin untersuche ich die Auswirkung der Abgeschlossenheit dieser Inseln auf die Fähigkeit der öffentlichen Verwaltung, Regelungen zum Schutz von natürlichen Wasserressourcen zu entwickeln und zu implementieren. Darauffolgend nähere ich mich dem Problem aus der Perspektive der Größe: Kann eine kleine öffentliche Verwaltung Regelungen entwickeln und in einer zielführenden und effektiven Art intervenieren? Welche Auswirkungen hat es, wenn die Verwaltung abgeschlossen und klein ist?
Um diesen sich neu ergebenden Fragen in Bezug auf die Politikgestaltung zu begegnen, setze ich mich zum einen mit Rechtsgrundsätzen und deren offizieller Regelung auseinander. Zum anderen beschäftige ich mich mit den Aspekten menschlichen Verhaltens und Transaktionen aus der Sicht der klassischen Institutionenökonomie. Die Gründe für die Funktionsstörungen werden somit im Bereich der Transaktionen zwischen Akteuren, deren Regularien und dem sie fördernden Einfluss von offizieller Seite auf unterschiedlichen Ebenen gesucht.
Basierend auf meiner Analyse schlussfolgere ich, dass die Top-down-Strukturen und die zentral gesteuerten Regularien die Hauptursache sind, dass es zu keiner vernünftigen Veränderung oder gar einer Lösung der Probleme im Wassersektor kommt. Mehr noch, sie sind die eigentlichen Gründe für die Misere und deren Persistenz. Eine Dezentralisierung der Steuerung und eine Unabhängigkeit der lokalen politischen Ebene (institutionell und finanziell) stellen einen vielversprechenden Ansatz zur Verbesserung der Situation dar. Beamte vor Ort kennen die örtlichen Gegebenheiten und fühlen sich verantwortlich für die lokale Bevölkerung. Dies wiederum führt zu einer Steigerung der Kooperationsbereitschaft zwischen Bürgern und Regierungsbediensteten.

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Berlin, June 2018 Ourania Papasozomenou

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## Abbreviations and Terms

| | |
|---|---|
| CMO | Common Ministerial Orders |
| DA | Devolved Administration of the South Aegean |
| EYDAP | Athens Water Supply and Sewerage Company |
| EYATH | Thessaloniki Water Supply and Sewerage Company |
| FEK | Government Gazette |
| GDP | Gross Domestic Product |
| IAD | Institutional Analysis and Development |
| IoS | Institutions of Sustainability |
| MoA | Ministry of Agriculture |
| MoU | Memorandum of Understanding |
| ND | New Democracy |
| NRGAS | National Registry of Water Abstraction Sites |
| PASOK | Panhellenic Socialist Movement |
| RD | Regulatory Decisions |
| SYRIZA | Coalition of the Radical Left |
| TIIC | Transaction-Interdependence-Institutions-Cycle |

# 1 The Water Crisis in the Cyclades, Greece

## 1.1 The Problem at Hand: Dysfunctions within the Cycladic Water Sector

Recovering from the devastation of the Second World War, the ensuing four-year civil war that ended in 1949, and a seven-year military junta (1967-1974), Greece went through its golden years after the fall of the dictatorship in 1974 and the abolition of the monarchy, in what is called the *Metapolítefsi* (regime change). Only seven years after the birth of the Third Hellenic Republic in 1974, Greece joined the European Economic Community in 1981, and Community funds were then channelled into its public treasury for infrastructural development, modernising agriculture (Greece's main economic sector at the time) and structural interventions (Karamouzi, 2013; Gürsoy, 2003). The Greek economy seemed to flourish, and the citizens seemed content with the new democratic regime and the Europeanisation process (Teperoglou and Tsatsanis, 2014).

As the country opened up to foreign travellers and became one of Europe's key tourism destinations, the Greek islands and the island complex of Cyclades, in particular, benefited from public spending on constructing and improving local infrastructure to make the islands attractive for international tourism. New roads were constructed and paved, existing ones widened, ports were constructed, small seaside hotels and apartments – some with swimming pools – were built and recreational facilities such as restaurants and bars opened. Investing in tourism boosted local economies and revitalised regions that had suffered from out-migration. Indeed, tourists rushed to the Cyclades islands, but with them came an increased pressure on water resources (Zaharatos and Tsartas, 2005).

Water provision in the majority of the Cyclades, and on the islands of Tinos and Syros in particular, is often insufficient in *quantity* and is oftentimes interrupted, particularly during the summer when limited water resources are channelled to priority areas, particularly during peak hours in order to meet the increased needs of tourist accommodations. However, according to several Greek laws (for instance the 2003 Water Law and the Common Ministerial Decision Y2/2600/2001), water should be provided in *quantities sufficient* to meet all the needs of the entire population and – as emphasised in the Common Ministerial Decision – should be uninterrupted. Further concerns regarding water quantity have been

awakened by the great amounts of *water loss* from the network, ranging from 40% to 80% overall (Karalis and Emmanouilidis, 2011).

Furthermore, the issue of *water quality* often concerns consumers and local authorities alike. The network running through some of the Cyclades islands is aged and, because of poor maintenance in some areas, red oxidised water, unsuitable for human use, runs out of the pipes (Koini Gnomi, 2013). Due to health concerns, water authorities often have to issue warnings to inhabitants, urging them to stop using tap water until further notice (personal communication).

Frequent water quality problems have become a reason for inhabitants to lose their trust in the safety of tap water. Thus, they only use it for washing and personal hygiene and prefer to buy bottled water for drinking and sometimes even for cooking, adding on average 500 to 800 euros to what households pay annually for water (Karalis and Emmanouilidis, 2011). In 2014, a household of three persons on the Cycladic island of Syros with an average monthly water consumption of 70$m^3$ had to pay approximately 50 euros per month for covering its water needs (Municipal Water and Drainage Company of Ermoupolis Syros, 2017). Meanwhile, the average cost in Athens was considerably lower, at 20 euros per month (EYDAP, 2017).

We see then that the problem of the water sector of Tinos and Syros – typical of the majority of the Cyclades islands – can be understood as a combination of the insufficient quantity, poor perceived quality and high cost of water. Various responses have been attempted by national and local governments: laws were passed, technical solutions were pursued, and two administrative reforms were implemented. These responses, however, have been predominately focused on only tackling the quantity and not the quality or cost of water.

One attempted means of resolving the problem, mainly pursued by national governments in the 70s and 80s, was the construction of dams and reservoirs, a manifestation of the engineering way of thinking about water provision. Dams and reservoirs were constructed throughout the Cycladic islands, with various degree of success in retaining water. In parallel, extensive water distribution networks were constructed, providing water to the majority of island inhabitants. The settlements not covered by such networks include those which were either too remote, with challenging geomorphology, making it prohibitively expensive to expand the network there, or in some cases were outside the urban planning zone (illegally constructed settlements) and, thus, lay outside the jurisdiction of local authorities.

The *transfer of wat*er via tankers from the mainland – another decades-long state-subsidised solution – was heavily criticised as being too expensive, unsustainable, undemocratic and as serving hidden agendas (Danilakis, 2012; Gikas and Tchobanoglous, 2009). National governments commissioned water tankers that carried water from reservoirs in mainland Greece to islands in the Cyclades. The water was then stored in small publicly owned tanks and reservoirs on the islands, whose inhabitants paid a very low water price.

More recently, local governments in the Cyclades have commissioned *desalination plants*, over 20 of which have been installed and are operating (Karalis and Emmanouilidis, 2011), providing water to inhabitants and hundreds of thousands of tourists visiting these islands during summer. These desalination plants are powered from local electrical grids, with power stations operating on mazut, a low-quality fuel oil. The average cost for each cubic meter of water produced by the plants is 0.84 euros on Syros and 0.62 euros on Tinos (op.cit), in part explaining why consumers in the Cycladic islands need to spend more for the most expensive water in Greece.

Greek governments have invested considerable time, effort and financial resources in tackling the water provisioning problem for the Cyclades islands. Since the late 80s, two major institutional reforms have been carried out, merging jurisdictions and decentralising decision-making power. These reforms were intended to grant local authorities greater independence from Athens regarding, amongst other matters, water management, with the purpose of allowing them to design and implement water management policies best suited to local conditions and needs.

In this process, two major water laws were passed in order to integrate responsibilities among different authorities and regulate water use and planning: the Water Law of 1987 (MDEV, L. 1739) and the transposition of the European Union's Water Framework Directive in the Water Law of 2003 (MEPPW, L.3199) (Kampa and Bressers, 2008). The 1987 Water Law sets out a framework for water use permits, whereas the 2003 Water Law requires setting up Regional Water Directorates in each of the country's regions, with the aim of protecting and managing river basins within them (Kampa and Bressers, 2008). The Regional Water Directorates are also responsible for handling water quality and quantity issues. This was reinforced by a 2011 Administration Reform named *Kallikratis*, according to which additional jurisdictions have been given to regional administrations. More specifically, the regions have now become the ones responsible for planning and financing water works.

## 1.2 Research Questions and Objectives

Against this background, I aim here to understand the reasons for the apparent inability to rectify the problems facing the water sector of two selected islands in the Cyclades (Syros and Tinos), based on the assumption that the above-outlined technical and administrative steps have been taken to tackle them. I thus seek to answer the following research question: *Why is the water sector in the Cyclades still dysfunctional, despite the implementation of technical solutions and administrative reforms aimed at rectifying its shortcomings?*

My research has been based on the institutionalist and pragmatic approaches, which respectively hold that institutions are crucial to understanding human action and that human action is context-dependent. I have also drawn on the tenets of nissology – the study of islands – which holds that islandness, also called the "island mind", offers a cognitive template distinct from the "mainland mind" and, in its turn, differently shapes human (inter)action among island dwellers. In the light of this theoretical background, I pose the following sub-questions: Firstly, *how does the level of administration (national, regional, local) exert influence on how water resources are governed in the Cyclades?* Secondly, *what is the role of the geography of the Cyclades? Does islandness shape the ability of local and national administrations to govern water resources in these islands?*

## 1.3 Research Roadmap

These research questions have shaped the research roadmap I have taken (Fig. 1), guiding the methodological steps deemed necessary. As an initial step, I adopted an abductive research approach to guide me through the research process, assuming that it would allow me to unravel the reasons behind the dysfunction, as it requires the researcher to create and empirically check the plausibility of hypotheses that might explain the occurrence of a surprising phenomenon – in this case, the dysfunctional water sector of Tinos and Syros – by immersing herself for alternate periods in the relevant social world and withdrawing again for reflection and analysis. I also selected the case study approach as a method for obtaining empirical data and have applied other qualitative methods to allow me to form a holistic view and in-depth understanding of the water sector in Tinos and Syros.

With this theoretical underpinning in mind, I have taken a three-phase empirical approach. During the first phase and following a literature review, I conducted an explorative stay of on month on the two selected islands, where I had informal interviews with residents and officials that led to verification of the relevance of my research questions. When I returned

from the trip, I reflected on what I had learned and formed hypotheses on the reasons for the dysfunction. The second empirical phase, consisting of a stay of one month, included a second and more focused round of recorded interviews. This phase led to revision of the analytical framework, based on the insights gained from the interviews and theorising the concepts that emerged from them, and concluded with another round of reflection and formation of hypotheses that were then tested in the third and last empirical phase. During this phase, during 45-days stay, the analytical framework was finalised, and the third round of interviews took place, accompanied by data analysis and discussion of preliminary results. In the final step, I reflected upon the theoretical and empirical insights gained pertaining to the research questions in order to write the present monograph.

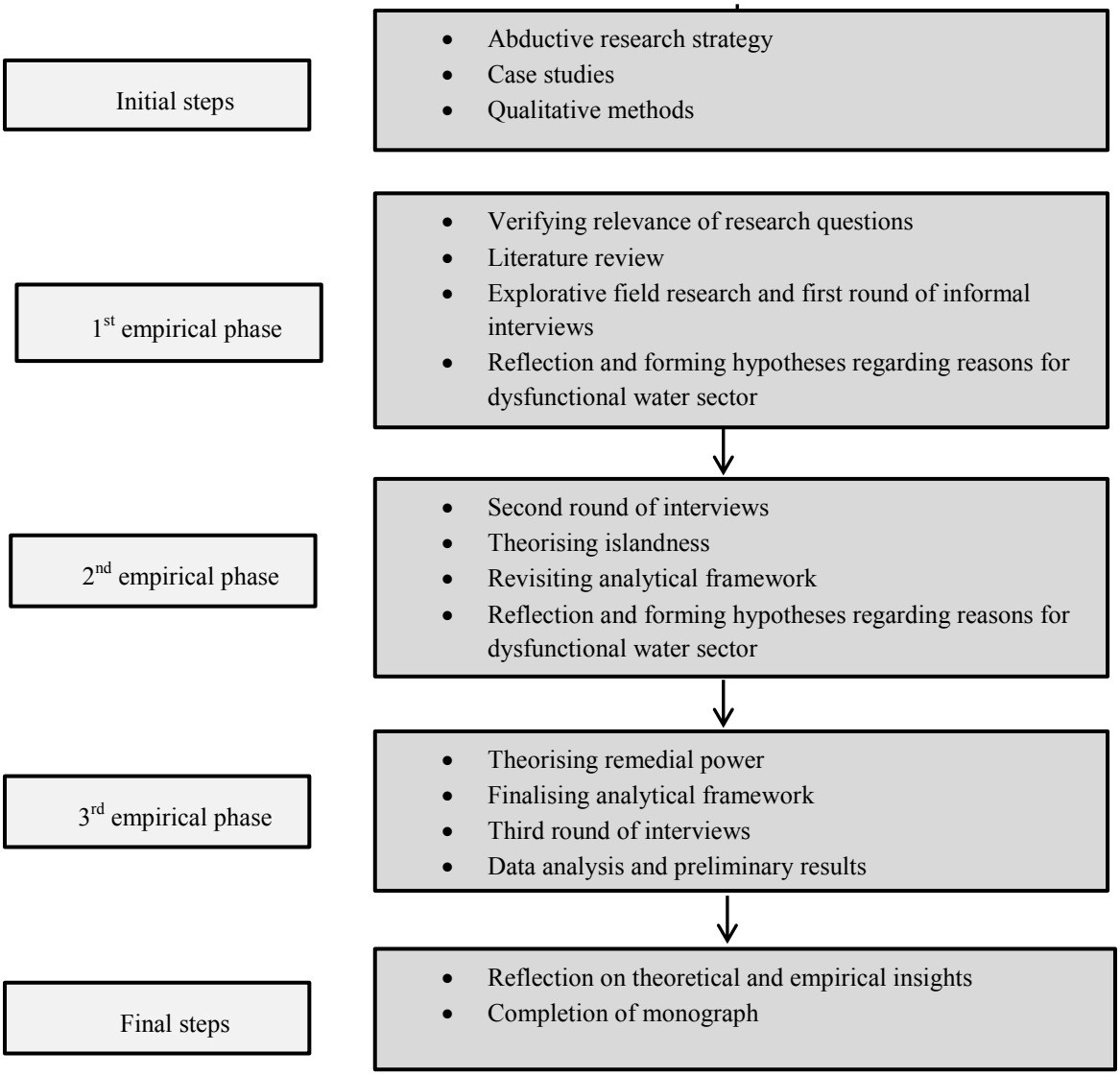


Figure 1: Overview of the research roadmap for the present study
*Source:* own compilation

## 1.4 Structure of this Work

This dissertation is organised into six chapters, beginning with the current chapter describing the problem at hand and specifying my research questions. Chapter 2 discusses water as a resource and offers a relatively detailed description of the Cyclades island complex and the two selected islands, looking at their administrative structures, socio-economic characteristics and status of their water resources. It concludes with a description of the water sector in the Cyclades, especially focusing on and further specifying its dysfunctions.

Chapter 3 sets the theoretical grounding for the study. It conceptualises islands using tenets from administrative studies and nissology. It further considers approaches to understanding and analysing institutions from an institutional economics approach using transactions as the unit of analysis and combines the three concepts (islands, institutions, transactions). It concludes with the development of an analytical framework that brings these categories together and structures empirical research.

In Chapter 4, I explain the development of the research approach of the dissertation, and summarise the ontological and epistemological assumptions guiding it. I discuss the abductive research design and the methods of the empirical data collection employed as well as situate the empirical phase within the broader social context of the Cyclades and Greece.

In Chapter 5, I present my key findings, relating them to the conceptual framing used for the study, and tell the story anew by summarising them. Finally, Chapter 6 provides the main conclusions derived from the analysis and their implications for institutional change needed for rectifying the water sector in Tinos and Syros.

# 2 The Diagnostic Imperative

In order to analyse a problem, one must first understand it and clarify the concepts used so as to make clear what is being put under scrutiny. The present study poses the question, "*why is the water sector in the Cyclades dysfunctional, despite attempted government responses to rectify it"*. Consequently, it seems to me that the main concepts we need to clarify at this stage are *water sector*, *Cyclades islands*, *dysfunction* and *responses*, as their meanings are determined by the context in which they are situated, entailing both the overarching socio-political and economic context and their dynamic nature over time.

The *socio-political and economic context* implies that legislators, policy makers, executives, bureaucrats, engineers, construction companies, and water users have a role in designing and running the water sector. Their actions are contextual and socially constructed. This means that social conditions – institutions and actor position, education, expectations, belief systems, economic status and so on – influence their perception of their role, their ability to act (and the range of actions they conceive as possible), as well as the options available to them (Vatn, 2015). Since water management is regulated by policies crafted by governmental bodies, it would seem logical to suppose that political conditions have a determining and direct influence on the water sector – and the extent to which it is functional or not. Thus, one cannot explain the dysfunction by limiting the scope of analysis to one geographical region: the Cyclades. Rather, the analysis must be expanded to cover the political entity that, in this case, is the Greek state, regarding how it directly and indirectly influences local conditions and capabilities in the Cyclades islands.

Since the water-sector dysfunction has persisted *over time*, it is important to understand how the main concepts used in this research have evolved historically at the level of the Cyclades islands as well as at the national level. Focusing only on the current status of the water resources, or on the political conditions prevailing in Greece, would only likely produce a static snapshot of a very complex nexus. By incorporating the component of time, causal relationships and path-dependencies can hopefully be identified that could offer valuable insights on possible rectification of the water sector.

In what follows, I address the concepts identified as being important for this stage of the study: *water* as a resource and its state in the *Cyclades*, focusing on the selected islands of Tinos and Syros. Furthermore, a rich description of the selected case studies is presented,

through which the *dysfunction* will be more precisely defined, as are the *responses* that have been attempted by key actors to rectify it.

## 2.1 The Cyclades Island Complex and Its Water Resources

The Cyclades is an island complex in the Aegean Archipelago, southeast of mainland Greece, comprising of thirty-three (33) islands, twenty nine (29) of which are inhabited, the largest of which covers an area of 430 $km^2$ and the smallest just over 3 $km^2$. The total population is roughly 120,000 inhabitants and largely varies from island to island: from over 20,000 people on Syros, the administrative capital island, to slightly over 100 on Koufonisi or Irakleia. A similar geomorphology is common to most of the islands, though, certainly to the ones selected as illustrative cases studies for the purpose of this research.

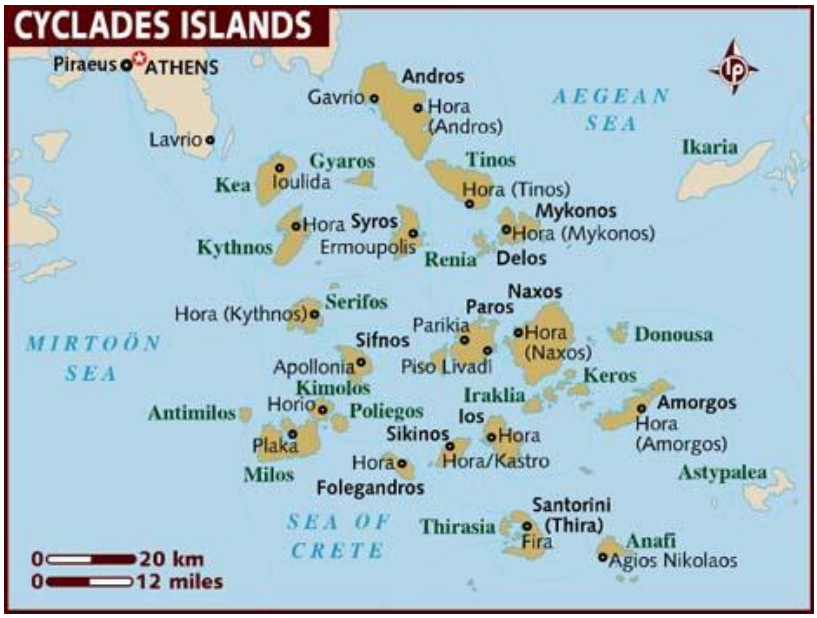


Figure 2: Map of the Cyclades
*Source*: Worldatlas

Beginning in 1998, the complex was under the administration of the Prefecture of the Cyclades, which was dissolved in 2011 by the Kallikratis Administrative Reform law 3852/2010 (Government Gazette, 2010). In its place, the Region of the South Aegean was created, which further included the Dodecanese Islands. Since 2010, the decentralised administration of this region, which is headed by a general secretary appointed by the central government, has been setting the region's agenda regarding water management. The next level is the prefecture, a self-governed administrative entity with a regional governor and

regional council elected every five years. Finally, there is the municipality, with a mayor and municipal council also elected every five years. As of 2010, each island constitutes its own municipality.

Table 1: Administrative form of the Cyclades, following the 2010 government reform

| Order of administration | Name and form of organisation |
|---|---|
| Decentralised agencies of the national administration | **Decentralised administration**, headed by a general secretary appointed by the Minister of Interior. |
| Secondary, regional-level self-governing entities | **Prefecture** headed by a popularly elected governor and governed by a popularly elected regional council. Prefectures are further subdivided into regional units, headed by a vice-regional governor. Elected every 5 years. |
| Primary, local-level, self-governing entities | **Municipalities** headed by a popularly elected mayor. Elected every 5 years. |

*Source:* own graphic

### 2.1.1 The Economy of the Cyclades

The economy of the Cyclades islands is based predominantly on tourism – mainly summer beach tourism and a mix of agriculture, fishery and industry (see Table 2). Touristic intensity varies within the islands, with some relying almost exclusively on tourism, while others engage in tourism as a complementary source of income.

Table 2: Percentage of Gross Domestic Product (GDP) per sector in the Cyclades

| | **Percentage of GDP per Sector in the Cyclades** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Agriculture %** | **Industry - Construction %** | Mining % | Processing % | Energy % | Construction % | **Services %** |
| **2000** | **4,6** | **15,3** | 4,2 | 1,4 | 3 | 6,7 | **80,1** |
| **2006** | **3,7** | **20,6** | 2,8 | 3,7 | 3,8 | 10,4 | **75,7** |

*Source:* South Aegean Prefecture,2012

Agriculture's contribution to the national and local Gross Domestic Product (GDP) has been steadily decreasing in the course of the last few decades, following a trend one can observe in the whole of Greece (South Aegean Prefecture, 2012). Agricultural production lags behind the national average, as productivity is limited by the poor quality of soils, small

plot sizes and paucity of water (South Aegean Prefecture, 2012). There are not many large plains in the Cyclades, and the plains that do exist are intensively cultivated, irrigated, and also salinated – or face severe risk of becoming so – due to sea-water intrusion in the groundwater, as a result of excessive groundwater pumping (South Aegean Prefecture, 2012; Stefopoulou et. al, 2008). Unsurprisingly perhaps, olive trees, which demand little water, are the dominant crop, covering over 41,000 hectares (Table 3). Agricultural production is based predominantly on the cultivation of olive trees, citrus fruits, potatoes, artichokes, and grapes. The main primary sector activity in the islands is animal husbandry, with many small units operating throughout the islands, breeding mainly sheep, goats and poultry (over 100,000 heads each).

The secondary sector is limited to small-scale family businesses (local crafts, bakeries, agricultural produce processing, and carpentry) which, however small, contribute significantly to the region's GDP, making up 20% of total business. They are also a valuable source of employment (South Aegean Prefecture, 2012). The only large-scale industrial activity in the island complex takes place on Syros, where a large shipyard and mining site are in operation.

Table 3: Crop and Area of Cultivation (in Hectares) in the Cyclades (2003)

| Crop | Area |
|---|---|
| Olive trees | 41.980,5 |
| Citrus trees | 2922,9 |
| Trees for fruit and nuts * | 1089,8 |
| Fruit trees | 809,3 |
| Potatoes (Naxos) | 5371 |
| Artichokes (Tinos) | 130 |
| Tomatoes (Santorini) | 360 |
| Fava beans (Santorini) | 1664 |
| *walnut, almond, etc. | |

*Source:* South Aegean Prefecture, 2012

The service sector – mainly tourism – is by far the most important economic pillar in the Cyclades. According to a strategic planning document of the South Aegean Prefecture (2012), the service sector accounts for almost 80% of the productive activity in the Cyclades. An indicator of the importance of the region's tourism sector is the fact that, although the islands cover just 2% of Greece's area and have 1.2% of total population, it comprises more than 20% of national tourist accommodation and beds (Hellenic Statistical Authority, 2011). As a result of the predominance and success of tourism, the Cyclades is amongst the regions in

Greece with the lowest unemployment rate, although employment in the tourism sector is seasonal.

Population is growing in the Cyclades. Unlike the rest of Greece, where population dropped for the first time, by 1.34%, as seen in the 2011 ten-year census (Hellenic Statistical Authority, 2011), the Cyclades region has shown a remarkable stable increase of 11% since 1991 (see Table 4). This can easily attributed to the steady –if only seasonable- employment opportunities made available through tourist-oriented business (restaurants, hotels and the like), that offer an incentive to local inhabitants to remain in the islands and to extended family members living in mainland Greece to return to them.

Table 4: Population in the Cyclades and Greece (1991–2011)

| **Population in the Cyclades and in Greece** | | | |
|---|---|---|---|
| | **Year of Census** | **Population (in 1000)** | **% Increase** |
| **Cyclades** | 1991 | 100 | |
| | 2001 | 111 | 11 |
| | 2011 | 124 | 11 |
| **Greece** | 1991 | 10,258 | |
| | 2001 | 10,939 | 7 |
| | 2011 | 10,815 | -1.34 |

*Source:* Compilation from Kaldellis and Kondili, 2007 and Hellenic Statistical Authority,2011

### 2.1.2 Water Resources in the Cyclades

Geographically, the islands are semi-mountainous with small plains, and the climate is temperate Mediterranean, with the average temperature ranging between 16.5–19.5 °C. On average, the islands receive approximately 350 mm of rainfall annually (Fig. 3). Naturally occurring surface water is very limited, as the small size of these islands does not allow for its creation and sustenance. For this reason, rivers are usually ephemeral torrential ones, and the majority of the relatively large surface water bodies have been artificially constructed and are, in fact, water reservoirs or dams. Groundwater is abstracted rapidly and beyond the recharge rate, and some aquifers in the islands have by now become salinized (Fig. 5). Unregistered and uncontrolled private abstraction is oftentimes five times larger than registered public abstraction, further intensifying groundwater depletion.

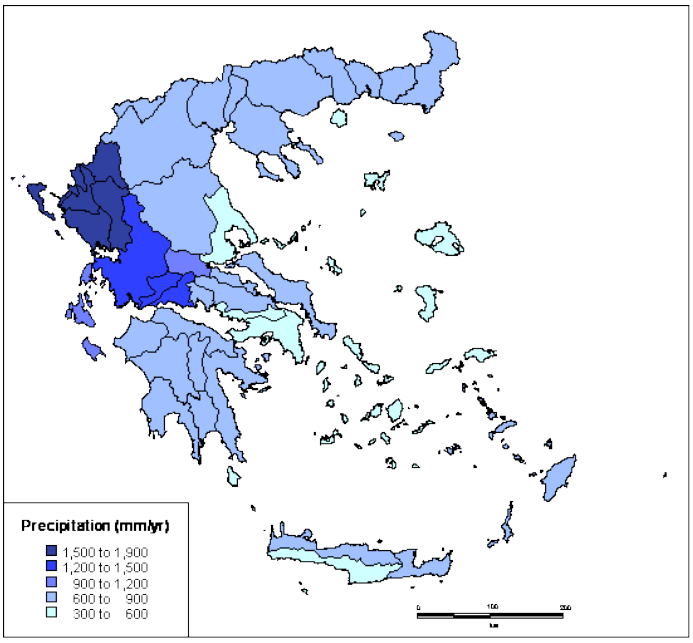


Figure 3: Distribution of total precipitation in Greece
*Source:* Stefopoulou et al., 2008

To illustrate the extent of water shortages in the Cyclades, various indices are used, for example, the consumption index (Fig 4), which is defined as the ratio of total water demand to total available water resources. Values higher than 80% represent possible water shortage, whereas values higher than 130% represent severe water stress conditions.

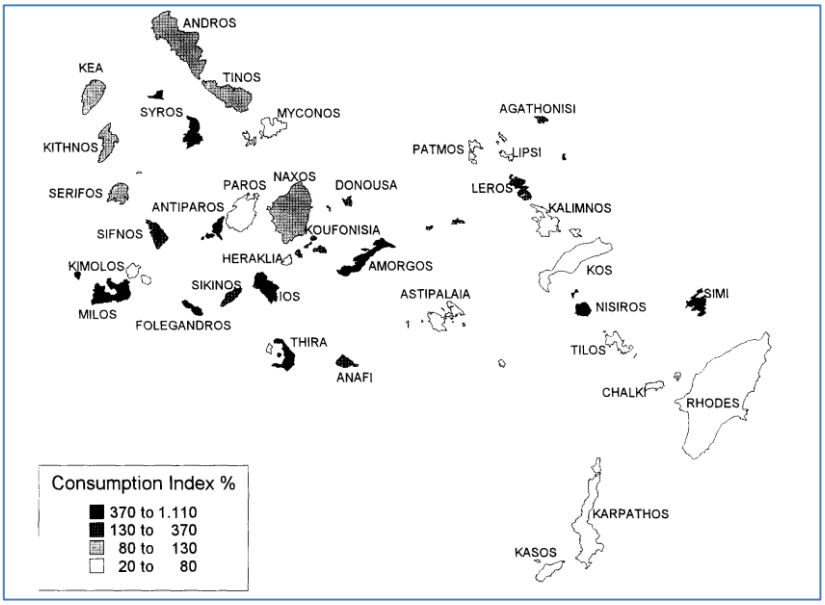


Figure 4: Water consumption index in the Cyclades and Dodecanese
*Source:* Stefopoulou et al., 2008

Figure 4 demonstrates that in the Cyclades there are essentially no islands that do not face some form of water shortage, with the exception of Paros. Furthermore, it seems that water

shortage is the norm, and the only variation is the degree of it. For the smaller islands in particular, water scarcity is even more intense.


Figure 5: Areas in Greece facing aquifer salinisation
*Source:* Stefopoulou et al., 2008

As a result of decreasing water tables, groundwater is being salinised by sea-water intrusion, a wide-spread occurrence as Figure 5 testifies. This reduces the quality of drinking water and renders other, more costly water supply options (such as desalination and transfer) unavoidable. Furthermore, due to the mountainous geomorphology of the islands and abandonment of previously cultivated terraces, topsoil is eroding and rain generally does not reach the groundwater level, further intensifying the risk of desertification.

Currently, water intended for human consumption in the Cyclades usually comes from two sources: a) wells, which mainly supply agricultural facilities and other small-scale uses not requiring purification, and b) a municipal network, which provides potable water to residences, commercial, industrial and tourist facilities.

One can talk of conventional and non-conventional water sources, renewable and non-renewable, surface and groundwater. Gikas and Aggelakis (2009) follow the

conventional/non-conventional divide and describe water management in the Aegean islands. According to Gikas and Aggelakis, conventional sources of water generally include: a) precipitation, b) artificial lagoons and dams and c) transportation of potable water from the mainland. Non-conventional sources include: a) desalinated water, b) treated wastewater, c) drainage water, d) brackish water or excess rainwater and e) traditional water-collection techniques, such as runoff collection from roofs and other paved surfaces. In the Cyclades islands, the only forms of non-conventional water used are predominantly desalinated water and, less so, collected runoff water.

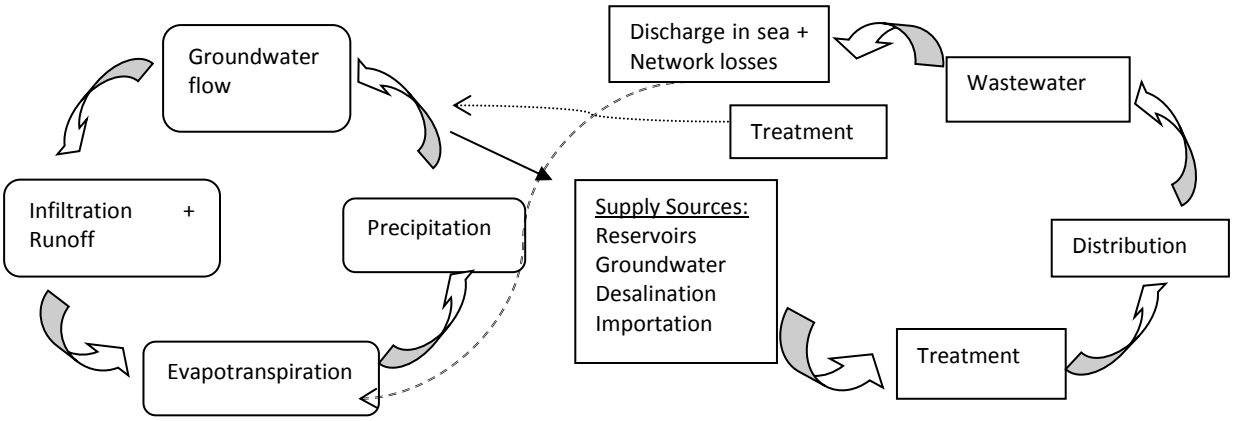


Figure 6: Physical and human hydrological cycles in the Cyclades
*Source:* Own graphic

A typical municipal network for distribution of potable water consists of the following. Water is stored in reservoirs or other storage facilities and fed into a treatment plant for purification (removal of impurities and addition of chemicals), which ensures potable water quality standards. The purified water is then transferred via pipes in storage tanks to be released upon demand. In the case of desalination, water must first be produced. Sea water is pumped and transferred to the desalination plant, where salts and minerals are removed. Another pipeline system then transfers the desalinated water to the connection point of the existing water network. Figure 6 provides a visualisation of the physical and human hydrological cycles in the Cyclades islands.

Water storage facilities are of utmost importance in arid regions, and especially the Cyclades, as water transferred from water-richer regions is stored there until needed. Some islands –particularly smaller ones- rely increasingly on water transfers from the mainland for covering water needs, which peak during summer months. Table 5 illustrates the increasing reliance of small arid islands on transfers from 1997 to 2004, as larger islands now cover their

needs through desalination plants. The amount of water imported increased by almost four times: from 86.000 $m^3$ in 1997 to 330.000 $m^3$ in 2004.

Table 5: Quantity and transport cost of water in the Cyclades

| Quantity and transport cost of water in the Cyclades | | |
|---|---|---|
| **Year** | **Quantities (in 100.000 $m^3$)** | **Cost (in 100.000 euros)** |
| 1997 | 86 | 311 |
| 1998 | 91 | 650 |
| 1999 | 87 | 672 |
| 2000 | 145 | 1,158 |
| 2001 | 202 | 1,625 |
| 2002 | 328 | 2,561 |
| 2003 | 335 | 2,772 |
| 2004 | 337 | 2,787 |

*Source:* Karagiannis and Soldatos, 2007

In Table 6, one can observe the intense seasonality of water transport, as the volume of water transferred increases five-fold during the third annual quarter, which coincides with the tourist peak.

Table 6: Seasonality of water transport to the Cyclades (in $m^3$) in 2004

| Seasonality of water transport to the Cyclades ($m^3$) in 2004 | |
|---|---|
| 1st quarter | 33,000 |
| 2nd quarter | 88,000 |
| 3rd quarter | 148,000 |
| 4th quarter | 68,000 |
| Total | 337,000 |

*Source:* Karagiannis and Soldatos, 2007

According to available data, from 2006 until 2014 water transfers cost over 70 million euros, with a cubic meter in the arid islands costing five times as much as in Athens (Koinignomi, 2016; Kathimerini, 2014). In 2014, 5.5 million euros were spent on transferring water to the Cyclades and another island complex, the Dodecanese. Several actors in the Cyclades as well as researchers have proposed constructing desalination plants, the construction costs of which would not exceed 3.1 million euros, a fraction of what is spent annually for importing water.

This is not to say that desalination is a panacea, as desalinated water is still much more expensive than abstracted groundwater. Consequently, Ermoupoli, the capital of the island Syros, which essentially receives all municipal water from desalination plants, has the most expensive water in Greece. For 30 $m^3$ of water, a household in Ermoupoli pays 51.38 euros, whereas in Athens, a household would pay 30.70 euros for the same amount (Stefopoulou et al, 2008).

In the Cyclades, water losses from the water network itself have been attributed to leaks amounting to at least 40%[1] (Kathimerini, 2014; Voivontas et al., 2003). The network pipes are aged and, as there are no monitoring possibilities meters within the network to locate leaks early on, it is very difficult to spot them unless a pipe bursts. The severity and persistence of water losses in the network are known to local authorities, who have been gradually trying to modernise them (South Aegean Prefecture, 2012). Such losses are so commonplace in the islands that networks have been constructed to accommodate larger volumes than actually required so as to compensate for them (personal communication). To put this in more concrete terms, water networks in the Cyclades are constructed to accommodate 200 litres/person/day (personal communication). As there are no laws or guidelines clearly setting this capacity, it was set according to the experience of planners, local settings and local conditions. In the Cyclades, consumption is 120 lt/person/day, averaged between winter and summer. The remaining capacity (80 lt) is designed to accommodate for losses in the network, watering of gardens in rural areas and often unexpected increases in need for water.

Another factor contributing to increasing water shortages is the common practice in the Cyclades islands of discharging treated wastewater into the sea, rather than re-using it for agricultural purposes, which could improve the quality and quantity of local agricultural produce while reducing pressure exerted on local water resources due to drilling wells. As farmers would not have to drill so deep to find water, which is expensive, it would also reduce production costs.

Non-conventional sources generally require additional investments in new infrastructure, in additional to the existing water distribution network. Since water works infrastructure are strictly local (due to the isolated nature of islands), they are small in scale and, therefore, considerably more expensive than those on the mainland. The same applies to desalination plants using fossil-fuel energy.

[1] Karalis and Emmanouilidis (2011) estimate water losses to actually be as high as 60%, owing to a combination of losses through leaks and water flowing unmetered, due to the poor condition of water meters.

## 2.2 The Selected Islands

Two Cycladic islands have been selected as case studies – Tinos and Syros – which are situated on the northern side of the island complex, just over 20 km apart. Despite their proximity, however, they are very different in many aspects.

### 2.2.1 Syros

Syros is the administrative capital of the Cyclades and also of the Prefecture of South Aegean and has an urban character. It seats the majority of public services, such as the peripheral court, tax office, and administrative headquarters of the Cyclades, including the Water Directorate[2]. In 2010, the only university department in the Cyclades – the Department of Product & Systems Design Engineering – was founded in Ermoupoli[3] by the University of the Aegean adding to the urban character of the island. Over half of the island's population lives in Ermoupoli, a densely built city.

The Cycladic islands have been inhabited for thousands of years, and many contemporary villages and towns have evolved around those ancient settlements. This is not the case for Ermoupoli, which is a relatively new settlement compared to other Cycladic cities and was founded by over 30.000 refugees fleeing from slaughter and persecution as a result of the Greek revolt against the Ottoman Empire in 1822. From early on, Ermoupoli, and therefore also Syros, became a national industrial and commercial hub with a growing urban population.

Already in the 1856 census (Koufodimos, 2007), Ermoupoli was mentioned as the second largest city in Greece after Athens. With the establishment of the Hellenic Republic in 1830, the majority of foreign trade fleets docked in the port of Ermoupoli, illustrating its central role in the geopolitics and trade of the time. Ermoupoli kept on growing, with high schools, a theatre (a small-scale replica of Milan's Scala), a city hall and one of the largest squares in Greece. When the port of Piraeus, situated very close to the capital Athens, opened in 1880, Ermoupoli's trade activities declined. In their place, a relatively large industrial zone was created, with a shipyard, tannery, textile-spinning mills and the like. To this day, the shipyard is a stable and important source of employment for the residents of Syros, despite its declining stealth.

[2] The Water Directorate is a department within the Devolved Administration of the Aegean, which in turn is a branch of the Ministry of Interior.

[3] Ermoupoli is sometimes also spelled Hermoupolis.

The other main employer is the public sector. As the administrative capital of the Prefecture of South Aegean, which consists of the island complexes of the Cyclades and the Dodecanese, Syros is the island with the highest percentage of employment by the public sector in the Cyclades (Hellenic Statistical Authority, 2011).


Figure 7: Map of Syros
*Source:* Greecetravel, no date

As in any other Cycladic island, for Syros tourism plays a crucial role in the local economy as well. The tertiary sector overall employs more than 50% of the workforce. As in Greece, tourism is not accounted separately from other service sector activities, so no exact statistics exist on how many people are employed by businesses that are directly associated with tourism (e.g., hotels). It can be assumed, however, that restaurants, small retail shops, bars, cafeterias, crafts shops and similar small businesses benefit to a large extent from increased tourist activities.

### 2.2.2 Tinos

Tinos is the fourth largest island in the Cyclades with 8.590 inhabitants, half of which live in the port and capital, Chora. Tinos has a very strong religious tourism sector, concentrated on the island's capital during Easter and summer. Similar to Syros, most of its infrastructure, facilities and services are concentrated in the capital, although it no longer has a tax office and similar services as they were merged and moved to Syros as a result of budget restraints.

Unlike Syros though, Tinos has a variety of economic activities, such as cropping, animal husbandry, minor processing industry, none of which are predominant in the island and rather complement the main income sources of people as part-time activities. Water provision efforts have also been concentrated on the capital, where the urban population lives.

The primary sector remains an important hub of activity on the island, as Tinos is amongst the most active islands in crop production and animal husbandry (as well as dairy products) in the Prefecture of South Aegean (Prefecture of South Aegean, 2012). It is indicative that in 2001 more than 11% of the workforce in Tinos was engaged in the primary sector, compared with 3.7% in Syros. By 2011, these numbers had dropped to 7.11% and 2.89%, respectively, as can be seen in Table 7 (Hellenic Statistic Authority, 2011).


Figure 8: Map of Tinos
*Source:* Villa Artemis, no date

Table 7: Employment by sector in Tinos and Syros, based on the 2011 Census

| | **Tinos** | | **Syros** | |
|---|---|---|---|---|
| | Total | Percentage | Total | Percentage |
| **Employed** | 3164 | 100 | 7525 | 100 |
| Primary Sector | 225 | 7,11 | 218 | 2,89 |
| Secondary Sector | 829 | 26,2 | 1538 | 20,42 |
| Tertiary Sector | 2100 | 66,37 | 5769 | 76,566 |
| **Unemployed** | 500 | 15,8 | 1509 | 20 |

*Source:* Hellenic Statistic Authority, 2011

On the other hand, during the period 2001-2011, unemployment doubled on both islands, increasing from 8.7% to 15.8% in Tinos and from 9.71% to 20% in Syros (Hellenic Statistic Authority, 2011; Prefecture of South Aegean, 2012).

### 2.2.3 Water Sources in Tinos and Syros

Water sources in Tinos and Syros vary. In Syros, where drilling has now reached 500 meters below the surface –making drilling very expensive, on the one hand, and providing salty water as well – the local administration has opted for a water provision system almost exclusively based on desalination. Thus, 95% of water running in the Syros water network is desalinated, and the remaining 5% is provided by municipally owned drilling wells (personal communication). Until the 1980s there was no water network set up in Syros, with the exception of some small parts of the island. Water supply was carried out via water sellers: small-businesses extracting water from wells and then selling it to households for a price (Nokas, 2010).

In Tinos, since 2001, when the first desalination plant was constructed, three quarters of all the water intended for consumption has been produced through desalination. Up to 2001, water was secured through dams, groundwater drilling and occasional transport via water tankers. The dams of the island can retain up 100.000$m^3$ per year, enough to account for 15% of all water provision. The remaining 10% is drilled from groundwater or collected from fresh water springs. Increasingly, the local administration is planning to construct more desalination plants, as water precipitation is erratic, the dams do not retain enough water in some years and groundwater is already heavily deteriorated in many parts of the island. Worth mentioning here is that, although all the dams in Tinos were constructed by the Ministry of Agriculture, farmers consume less than 10% of the water collected in them. The rest is allocated for domestic and touristic uses (Nokas, 2010).

Tinos' population doubles in the summer months, when water consumption increases from an average of 1.500$m^3$/day to an average of 2.700$m^3$/day/person. Syros follows a similar pattern, with consumption doubling during summer and reaching 3.000$m^3$/day/person. Water managers on the islands distinguish between winter consumption (between September and May) and summer consumption (between June and August). It is generally accepted that winter consumption can be met without interruption and with relatively high water quality with the current mix of water sources. The challenge arises when the water collection, production and distribution network's capacity has to more than double its output for three crucial months a year.

### 2.2.4 Water Governance on Tinos and Syros

There was an administrative reform in 2010, known as *Kallikratis*, through which jurisdictions were re-allocated (see Table 8 for an outline of the main actors and their jurisdictions regarding water management). Since 2010, the administrative apparatus for the region has consisted of a national decision-making centre and a regional one. The national one is represented by the Devolved Administration of the Aegean, covering the Cyclades, the Dodecanese and Crete. Its seat is in Piraeus, on mainland Greece. Its mandate includes regulatory representation of the central government in its geographical coverage area: the Aegean Sea.

Table 8: Main actors in water governance in Syros and Tinos

| Actor | Level | Established | Seat | Jurisdictions | Appointed/ elected |
|---|---|---|---|---|---|
| **Special Secretariat of Water (Ministry of Environment)** | National | 2010 within the WFD | Athens | a. Implements Water Management Plans<br>b. Monitoring and coordination of all state agencies and institutions involved in water management.<br>c. National water monitoring programmes | Appointed |
| **Ministry of Agriculture** | National | 1910 | Athens | Provision of water for agricultural use (via dam construction):<br>• assigns water-related studies;<br>• issues licences for the construction of dams (when possible also co-financing them) | Appointed |
| **Devolved Administration of the Aegean (Ministry of Interior)** | National | 2011 | Athens | • Regional policies | Appointed |
| **Water Directorate of South Aegean (branch of Devolved Administration of the Aegean)** | National | 2011 | Syros | • Issues permits for all water uses in South Aegean<br>• Imposes fines for breaches of law | Appointed |
| **Prefecture of South Aegean** | Regional | 2011 | Syros | • Collects and processes applications for water uses and recommends to the Water Directorate regarding their acceptance or rejection<br>• Rural development (in cooperation with the municipalities)<br>• Imposes fines for environmental violations (pollution, illegal dumping of waste in water streams and so on).<br>• Responsible for good quality of aquifers and monitoring (but has no control over permits for water use) | Elected |

| | | | | | |
|---|---|---|---|---|---|
| | | | | • Proposes and issues Regulatory Decisions which can, however, be blocked by the Devolved Administration<br>• Conducts studies and water works on small islands (usually with population of less than 4.000) that do not have the personnel, technical know-how or other means to plan water works | |
| **Municipalities** | Local | 2011 | In every island | • Conduct controls to check for violations (illegal boreholes, dumping, pollution of streams, etc)<br>• Water provisioning for all uses except agriculture, including pipe-work, desalination, municipally owned boreholes, and wastewater treatment<br>• Responsible for assigning studies for projects and securing their financing.<br>• Rural Development, shared jurisdiction with the Prefecture, but also not having permit-giving authority<br>• Water pricing (where there are no municipal water and drainage companies) | Elected |
| **Municipal Water & Drainage Company** | Local | 1997 | Syros | • Maintains network and desalination plants<br>• Sets the price of water | Appointed |

*Source:* Own compilation

At the regional level, the Prefecture of South Aegean, covering the island complexes of Cyclades and Dodecanese, was constituted through the 2010 reform. According to the reform, the prefectures have the mandate to plan, schedule and implement policies on a regional level within their jurisdictions, in accordance with the principles of sustainable development, social cohesion and taking into consideration national and European policies. The inhabitants of the islands elect the heads of the prefecture every five years, together with the heads of the municipalities.

The municipalities are the last local administration level. Following the 2010 reform, each island is now its own municipality, with the exception of the Municipality of Naxos and Small Cyclades, where five very small islands have been administratively attached to the nearby larger island of Naxos. The municipality water administrations are elected every five years, and their main tasks include water provision, water pricing and securing funding for water-related projects. Some municipalities (like Syros) have established municipal water and drainage companies to take over water provisioning and pricing. Tinos, however, has no municipal water and drainage company.

## 2.3 Identifying the Dysfunction

The World Health Organisation (2003) has set optimal access to drinking water as being at least 100 lt/person/day, delivered through multiple taps simultaneously and able to cover all consumption and hygiene needs. In Greece, there is only a by-law setting minimum water provision requirements. In a 1991 Joint Ministerial Decision (D11/F.16/8500[4]), the six Ministers of Interior, Economics, Agriculture, Tourism, Environment and Industry set the minimum and maximum limits of drinking water for the "rational use of water" in domestic and touristic uses. According to the Decision, for residential areas the minimum requirement is set at 100 lt/person/day and the maximum to 250 lt/person/day.

Various legislative documents[5] decree that water should be provided in a *quantity sufficient* to meet all the needs of the population, and it is emphasised that such water provision should be uninterrupted. The 2003 Water Law additionally sets out a framework for water quality standards. We see, then, that there *is* a legal framework setting a minimum requirements for good-quality water that should be available in sufficient quantities and without interruption for human consumption.

When water supply is not sufficient to cover human needs, or when water quality is not use-optimal, then one can speak of water scarcity. Definitions of what constitutes scarcity differ, based on the discipline studying it, but where all definitions agree is the imbalance between water supply and demand. For example, the United Nations (UN) defines scarcity as "the point at which the aggregate impact of all users impinges on the supply or quality of water under prevailing institutional arrangements to the extent that the demand by all sectors, including the environment, cannot be satisfied fully" (UN, 2006, p.2), whereas the European Commission (EC) Water Scarcity Drafting Group (2006, p.23) defines scarcity as "a situation where there is *insufficient water to satisfy normal requirements*" (emphasis added).

Assimacopoulos (2008) distinguishes between what he frames as physical and socio-economic scarcity, with the former being "limited access to water resources, attributed either to climate conditions (water shortage) or to the unsustainable management of resources (e.g. overabstraction)" and socio-economic scarcity being best understood as society's economic inability to develop water resources as well having a lack of capacity to adapt to the physical

[4] Common Ministerial Decision Δ11/Φ16/8500/1991: Definition of minimum and maximum limits of needed quantities for the reasonable use of drinking water.

[5] Such as in the 2003 Water Law and the Common Ministerial Decision Y2/2600/2001.

manifestation of physical water scarcity (p. 1). The problem with Assimacopoulos' distinction between physical and socio-economic scarcity is the presumption that there exists such a thing as "physical scarcity", which is where the weakness of his argument is located. Overabstraction (which in turn leads to water shortage) is attributed to "unsustainable management of resources", which is seen as belonging to the "physical" and not as part of the socio-economic sphere.

Rijsberman (2006) introduces a different train of thought regarding what qualifies as scarcity. When an individual does not have access to good quality and sufficient quantity of water so as to satisfy her need for drinking, washing or sustaining her livelihood, then that individual is *water insecure*. When many people in an area are water insecure for a significant period of time, then that area is seen as being water scarce. In defining water scarcity, Rijsbermann considers a number of factors: a) whose water needs are not met? Are we talking about societal water needs, or are we taking ecological water needs into account as well?; b) the fraction of the resource made available for use or that could be made available; and c) the spatial and temporal scales of defining scarcity.

The current state water scarcity in the Cyclades is characterised as a deteriorating quality and quantity of drinking water that threatens to jeopardise the continuity of the islands' social, economic, and ecological processes. Salinisation of groundwater, for example, renders a substantial amount of water non-usable for irrigational or consumption purposes.

However, water scarcity is not simply a relation of quantity needed and supplied. It is more than that. For example, water quality and quantity might be sufficient in terms of numbers and could potentially provide for all users, but in practice some users might not be able to obtain access to it. Scarcity is, then, best understood as the effect of an *institutional status-quo* that allocates rights to access and use of a resource, in our case water (Vatn, 2005). Water scarcity is thus socially constructed (Aguilera-Klink et al, 2000). Kallis (2010) goes a step further to claim that water scarcity is institutionally and policy led. In addition to its social aspects, water scarcity is also a matter of the allocation or rights to and distribution of water.

Scarcity is not merely the result of the institutional status quo but is also a leading reason for the very *existence and change of institutions*. As Commons writes, "*it is only scarce things, actual or expected, that are wanted and desired. Since they are scarce, the acquisition of them is regulated by the collective action which creates the rights and duties of property*

*and liberty without which there would be anarchy."* (1934, p. 6). Here, Commons highlights the instrumental role of institutions in regulating scarcity, and indeed society as a whole.

Turning our attention again to the selected cases, we should note that on Syros, desalinated water is of very high standards in terms of quality, as it undergoes regular testing to ensure that no harmful substances are present. The process of desalination though produces water with a particular taste, which inhabitants of Syros have not yet acquired. As such, a very large proportion of water consumers choose not to consume water coming from the network. Instead, bottled water is used for drinking and cooking, or domestic desalination units are installed to re-filter the network water before consumption. Both options increase household water bills considerably and, at the same time, illustrate a lack of trust towards the municipal water network.

Desalinated water is also not used by the island's farmers, who as we have seen are drilling ever deeper to reach water and are increasingly faced with lower water quality, which reduces their yields. Calls have been made by farmers' associations to be allowed to utilise water from the island's wastewater treatment plants, but to no avail. Desalinated water is too expensive, and treated water is unavailable.

We can see, then, that the main problem in Syros is that, although one can argue that water provision via the municipal network is now reliable, uninterrupted and in quantities sufficient to meet the needs of the urban population, there are still two inhibiting factors. First, the urban population does not trust the municipal network water and, thus, they do not use it. Can one then really talk of "water provision in sufficient quantity" in this case? Second, farmers do not have access to water of good quality. Is sufficient quantity enough? Or should quality concerns be an issue as well?

In the case of Tinos, the dysfunction is obvious in terms of water quality. An issue present throughout the years has been the safety of the municipal network, as large parts of it are constructed with asbestos pipes – a fact that poses a considerable safety concern. As the percentage of desalinated water in the network increases, the taste of the water is also being altered and –again like Syros- many users (domestic and touristic users alike) opt for bottled water for their needs (Zikos and Papasozomenou, 2014). Increasing demand for water is exacerbating the problem further.

To sum up, we see that in the Cyclades, and more specifically in the selected islands of Tinos and Syros, the water sector is dysfunctional because the water provided is insufficient

to satisfy normal requirements; unless potable water it is produced by costly desalination, prolonged water scarcity becomes water insecurity; and given the social construction of this state of water scarcity – and hence insecurity – there are basically two logically linked paths that have caused it. The first one is that poorly designed institutions and policies have led to this chronic dysfunction, manifested as disrupted and insecure water provision (cf. Vatn, 2005 and Kallis, 2010). The second conclusion is that the same dysfunction itself (scarcity) acts, as per Commons, as a driver for these institutions to be changed. We can see here a vicious cycle, as the same apparatus that has created and sustained the dysfunction is then called upon to rectify it.

The question then becomes, how can this vicious cycle be broken? At which point in the process should interventions occur so as to positively alter the outcome? To this end, in the next chapter I explore potential theoretical foundations upon which to ground my analysis of possible rectifications for the water sector in Tinos and Syros.

# 3 Theoretical Grounding

## 3.1 Conceptualising Islands

The present study poses the question of why the water sector in the Cyclades is still dysfunctional, despite great effort being taken to rectify it. What is the reason for this evident inability to positively transform the water sector? Various explanations could help us in exploring hypotheses in the attempt to explain the dysfunction.

A possible explanation might lay in the very geographical nature of the Cyclades islands, that is, their insularity. To this end, the next section will examine the effect of insularity on the ability of administrations to set up and implement policies for securing water resources in this type of environment (Section 3.1.1). Then, in Section 3.1.2 I will approach the question from the perspective of size. Can a small local administration deliver policies and intervene in a meaningful and effectual manner? What happens if the administration is both insular and small? Finally, in Section 3.1.3 I consider the level of policy making. If the small island administration is not a sovereign one – meaning it is not a national state but is part of one – what is its scope of discretion? For the scope of this study, these concerns translate into the following questions: if the island administration has a limited scope of discretion/action, at which level should one look for solutions to the water sector dysfunction? Can the problem be fixed at the local level, that of the separate island(s), of at the regional level, that of the island complex of the Cyclades? Perhaps one should turn to the national level in search of a solution? Or perhaps better coordination between the various levels is needed? These questions will guide the inquiry for this manuscript.

### 3.1.1 Mediterranean Islands and Approaches to Water Management

The Cyclades are not unique in their struggle to achieve a balance between economic, social and ecological well-being within their limited geographical space. There is a growing body of literature on islands and water management, acknowledging the challenging nature of striking a balance between economic development and natural boundaries.

Islands are appealing to study in this respect because, if seen as insular socio-ecological systems (Zikos and Roggero, 2012; Liu et al., 2007; Millennium Ecosystem Assessment, 2005; Adger, 2000), they hold great potential to enhance our understanding of interactions between humans and the natural environment (Fitzpatrick and Keegan, 2007). It is important

to note that humans are not distinct from the natural environment; we are as much part of it as we are its users (Vatn, 2015). This becomes even more obvious in the case of islands, where biophysical boundaries, in terms of land and water resources for example, are finite and much more visible than the biophysical boundaries of their continental counterparts.

Studying islands presents epistemological and methodological challenges, because "we are grappling with the impact, conditioning and paradigmatic effects of the hybrid identity and 'location' of subjects (islanders, natives, settlers, tourists, second home owners), as well as those who would study them – who may be locals as well as outsiders (mainlanders, continental dwellers) looking in" (Baldacchino, 2008: 38). Defining islands is itself an elusive taks, and nissology, the study of islands, has offered many definitions of them. A prevailing one is that islands are pieces of land permanently surrounded by water whose surface is larger than 0,1 $km^2$ (Baldacchino, 2008). Islands are defined using a combination of minimum population size and area, minimum distance from the mainland and the absence of a fixed link to the mainland.

Meanwhile, the European Commission has lumped islands together with mountainous regions and sparsely populated areas as regions facing structural handicaps, which have consequently attracted increasing EU regional policy attention. The economic development of islands, mountainous regions and sparsely populated areas is considered important in achieving territorial cohesion within the EU (Armstrong et al, 2012, European Commission, 2007).

From a biophysical perspective, the majority of the Mediterranean islands share their semi-mountainous geography, thus combining two of the special geographical features spelled out in the EU's geographical cohesion policy: islandness and mountainous geography. One of the characteristics these islands have in common is their struggle to overcome acute and persistent water stress and secure stable and good-quality water provision for their inhabitants and visitors. Achieving sufficient water provision is a challenging task for these islands' administrations, which see their populations increase up to over 10 times during summer months, which is when the tourist influx is at its annual highest, whereas precipitation and water availability are at their annual lowest. Since islands are bounded by a physical discontinuity of space and territory (Spilanis et al, 2012), island jurisdictions, unlike their mainland counterparts, cannot call upon distant aquifers for water transfer. In what follows, I review various responses to water scarcity by other islands within the Mediterranean space and how they have been viewed within the pertinent literature.

Armeni (2008) notes that over 30% of Italian households reporting irregularities in water supply were located in islands. In this vein, Corsale and Iorio (2006) explore the relationship between tourist-sector development and water availability in a city in Sardinia, acknowledging the seasonality of water demand in a tourism-oriented city. They conclude that increasing water prices for local inhabitants would reduce consumption, thus making more water available for the summer months when water demand peaks.

Water scarcity amongst Italian islands has long been documented and attempts were already made to minimise its effects early on (Massarutto, 1999). Lazarova et al (2001) further document various attempts across the Mediterranean region to govern water resources of its islands in such a way so as to ease the pressure on local water resources, including reclaiming wastewater and harvesting rainwater, as implemented in Sardinia (Italy), Corsica (France) and the Baleares (Spain). They stress that, if these measures are to be successful, then they need to be part of an integrated water management plan and further identify steps to be undertaken for such management, such as: "(1) developing any undeveloped water resource, including desalination of brackish or sea water, (2) wastewater treatment and reuse, (3) inter-basin transfer, (4) more efficient irrigation systems, (5) minimizing water leakage, (6) application of adequate charges for water, and (7) importing water from neighbouring countries" (ibid, p. 27).

All of these measures have been applied across the Mediterranean islands in various degrees and combinations. Indeed, the examples used in the literature (Tirado et al, 2006; Kent et al, 2002; Chartzoulakis et al, 2001) spring from islands much larger than the ones examined in this study, both in terms of population and size (Table 9 below) In fact, Formentera, the smallest of the Balearic Islands, has received minimal attention in the literature, probably because the demand for water there is much lower there compared to the rest of the Balearics, which are touristic hot spots.

The degree of autonomy of these islands is also quite different than that of the Cyclades. The Balearic Islands are led by an autonomous, decentralised government that has the power to craft policies. The same applies to the large Italian islands of Sardinia and Sicily as well as for the Greek island of Crete. Malta and Cyprus are both nation states and, as such, have of course full control over their water policies.

Table 9: Population of Mediterranean islands (in thousands) and area ($km^2$)

| Island | Population (in thousands, in 2011) | Size (in $km^2$) |
|---|---|---|
| Sardinia | 1.582 | 24000 |
| Sicily | 5.074 | 25000 |
| Mallorca | 869 | 3640 |
| Minorca | 95 | 702 |
| Ibiza | 132 | 571 |
| Formentera | 10 | 83 |
| Malta | 423 | 316 |
| Crete | 623 | 8336 |
| Cyprus[6] | 1.241 / 840 | 9251 |
| Cyclades: (total) | 119 | 2570 |
| ***Syros*** | ***20*** | ***83*** |
| ***Tinos*** | ***10*** | ***194*** |
| *Santorini* | *13* | *90* |
| *Mykonos* | *7* | *105* |

*Source:* CYSTAT, 2011; Hellenic Statistical Authority, 2011; INE, 20111; ISTAT, 2011

It is reasonable to expect that the breadth of options available to an island of over a million people will be much greater than that of an island of twenty thousand, if only because of financial reasons. Mallorca, for example, can draw on financial resources much greater than what is available to Syros. It is also relatively certain that water resources will be greater in volume as well as more diverse in their origins on an island of thousands of square kilometres, compared to one that is ten or even a hundred times smaller. We can see, then, that smallness of physical size and population should be a concern when looking at water resources and their governance, though it does not seem to have particularly occupied scholars thus far.

The two Mediterranean islands examined in this study and mentioned in Table 9 above, do have a striking similarity between them: to a greater or lesser degree they are autonomous and exert control over their own policies, though always within EU frameworks. Thus, their size does not seem to affect their ability to self-govern, at least to the author's best knowledge.

[6] Population of the whole island / Population of the Republic of Cyprus

Consequently, we could speculate that their autonomy seems to be a determinant factor in deciding their courses of action relating to water management much more so than their small size.

In the next subchapter we will explore the concept of smallness as it pertains to islands and then relate it to the ability of small islands and small administrations to formulate effective policies.

### 3.1.2 Understanding Small Islands

In the relevant literature, one often sees the adjective "small" preceding the noun "islands". Indeed, the majority of the literature on islands is concentrated on smallness (Godenau, 2008; McElroy, 2003; King, 1993), particularly on small Caribbean islands. If one, however, applies the definition Baldacchino (2008) offers of islands – as pieces of land permanently surrounded by water whose surface is larger than 0,1 $km^2$ – then one can see that the majority of islands is in fact found in the temperate and sub-arctic zones of the northern hemisphere and not in the tropics, where the literature on islands has been focused (ibid).

Smallness is a debated term in the island literature. Is small a matter of land surface or perhaps of population? Of both? Can there be a clear definition of what constitutes a small island? There have been several attempts by scholars to define smallness in relation to, but not restricted to, islands. Smallness has been defined by primary indicators such as population size (Hein 1985; Kuznets 1960), land surface (Jalan, 1982), gross domestic product (GDP), (overlapping) social relations (Benedict, 1966), as well as in terms of international relations (the impact a small state has on international systems) and even by military indicators (Veenedaal and Corbett, 2015).

Baldacchino (2008) points to the relative nature of smallness. What may have been a small island off a mainland, can become in itself "the mainland" for even smaller islands, as is the case for Syros and the rest of the Cyclades. Defining smallness has been an elusive and, as many scholars now agree, even a seemingly arbitrary endeavour.

It is indeed the very concept of smallness that is of great interest and relevance for the scope of this study. Anthropologists, political scientists and geographers have long concerned themselves with defining smallness, and it seems that the very idea of smallness supersedes major differences between small states, small island states and small societies. Their smallness – as arbitrary as it is to define – is a trait common to all geographical or

administrative units that scholars choose to characterise as small. For the purposes of this study, I have taken Tinos and Syros to be both small islands and small societies at the same time. Yet smallness, as Baldacchino (2008) noted, is relative. Tinos is smaller than Syros because Syros has a larger bureaucracy and greater jurisdiction than Tinos, though they are both smaller than their national administrative capital.

Considering the breadth of small islands studied under the umbrella of nissology, we can observe that the Mediterranean islands have not attracted particular attention, probably because the focus of nissology has generally been placed on island states rather than island societies. Although, following their accession to the European Union in 2004, the Mediterranean islands of Cyprus and Malta have attracted scholarly attention due to their dual capacity as small national states and EU Member States, in this study we are concerned with even smaller islands, particularly ones that are not nation states. In short, here I focus on two small Mediterranean islands of Tinos and Syros, as they combine traits that are understudied in the literature and seem capable of offering valuable insights not only for the study of islands but also of policy formation and implementation.

### 3.1.3 Small Islands as Small Societies and Their Administration

Small countries, and indeed small societies, are not merely smaller versions of large countries. Their differences go beyond quantification, as their qualitative differences are profound. Compared to larger countries, the importance of individual and personal relationships and networking is overwhelming in small societies, jobs are multi-functional and more, often than not, they suffer from the effects of brain drain (Chittoo, 2011; Randma-Liiv, 2002).

Unlike geographers, anthropologists understand smallness as a function of the relationships individuals in a society develop rather than as a relative correlate of size. Randma-Liiv (2002) uses the terms "small states" and "small societies" interchangeably and offers an overview of the debate concerning small states (societies) and bureaucracies and the challenges they present for public administration. For the purpose of this study, "small states" refers to small societies, as it has been used interchangeably in the literature already. In a small-scale society, social relationships are over-lapping. As Benedict (1966) proposes, in a small society "*an individual interacts over and over again with the same individuals in virtually all social situations*" (ibid., p. 23). He maintains that there are two main categories of smallness: that of a territory and that of a society. The main criteria for territories (states) are their area and

population, whereas the criteria for societies are the number and quality of roles and relationships. He also notes that small societies can exist within large states that have a high degree of segmentation, such as islands due to their strict geographical delimitation, or in terms of minorities groups.

Benedict identifies several particularities of small-scale societies that are particularly relevant to the understanding and study of policy implementation. These particularities revolve around the axis of roles and relationships amongst a societies' members – and the consequent effects they have in the organisational structure of these societies. The qualitative divide between small-scale and large-scale societies can be conceived as the generally particularistic nature of relationships in the former and the universalistic kinds of relationships predominant in the latter.

In particularistic, small-scale societies, one can observe overlapping, congruent economic, political and kinship systems, where most social relationships end up serving many interests (Randma-Liiv, 2002; Benedict, 1966). Relationships and roles are person-specific; standards of judgment are based on who the person is, rather than what her actions are. Values used by members of society are to a large degree based on personal criteria, kinship and the position of an individual. As Benedict puts it, "*decisions in the economic, political, and legal fields have a pervasiveness in small-scale societies which they lack in societies of larger scale"* (op. cit, p. 28). In the legal arena, one can observe how juridical relationships are based on status and how, "because of the multiple connections between litigants, lawyers, and judges, small-scale societies often experience difficulties in applying impersonal law" (op. cit. p. 29). This is of particular importance for my study, since the officials that are called upon to implement a law in the Cyclades are embedded in a closely knit small-scale society with all the implications this entails for the implementation process.

Chittoo (2011) makes a case for the need of adaptation of small-state administrations to the particularities of their small scale, rather than continue the blind adoption of the large western, Weberian type of state. He elaborates on the administrative advantages and disadvantages that size (or scale) endows upon a society and, much like Benedict (1966), looks into the personal nature of administrative transactions, seeing as well the pervasiveness of decisions. Public officials are personally identified with and related to their decisions and their consequences, so it is not possible to separate their official tasks and their personal and social lives. This puts public officials under pressure and possibly causes conflicts as well, especially when unpopular decisions are to be implemented. Chittoo argues that perhaps the challenge lies not

in perfecting the detachment of roles of public officials but rather in capitalising on the deeply and pervasively personal nature of public life. But this suggestion contradicts the prevailing paradigm of impersonal bureaucrats who execute orders and do their duty within their scope of discretion.

As already mentioned, research on small societies and conceptualisation of smallness has been predominantly focused on small and developing island states, mostly in the Caribbean Sea, as well as on the genus of small states (not only *island* states) (Bertram, 2007 ; Randma-Liiv, 2001; Cock and Kirkpatrick, 1998; Baker, 1992). But so far very little attention has been given to small island societies *within* large states that meet Benedict's criterion for small societies–states. The level of analysis has therefore been different within the literature than the one relevant to the object of this study. Nonetheless, the small societies examined here face all the challenges that societies of small nation-states face, such as brain drain, overlapping of personal and professional roles undertaken by the same individual and, more often than not, fiscal challenges (Bertram, 2007). What is different about the small societies focused on in this study is precisely the fact that they are not states – they cannot unilaterally craft policies – but are rather the recipients of national policies decided upon in distant decision-making centres. Additionally, their insular character adds to the complexity of administration and governance.

The island studies literature has not been very strong on identifying the importance of levels of jurisdiction (national, regional, local) when it comes to the study of islands, because of its primary focus on sovereign island states that have full control over their policies. I propose that this gap in the nissology literature can be partly filled by also looking at institutional perspectives on governance; exploring why the water sector in the Cyclades is dysfunctional can greatly benefit from taking the island perspective into consideration, but it will need to go further than that.

Likewise, the public administration literature has emphasised the importance of both size and level of jurisdiction, but has been weak in acknowledging the limits set by natural geography, coupled of course with those of a specifically administrative nature. Another important drawback of the public administration literature with regard to answering the leading question of this study is that it has not usually been concerned with the process of policy making but rather seeks to offer a snap-shot understanding of bureaucracies. It thus lacks the dynamic aspect inherent in public policy processes and is, from my perspective, inadequate by itself to offer a satisfactory answer to the questions posed in this study, which

are aimed at explaining the chronic dysfunction of the water sector in the Cycladic islands of Syros and Tinos.

The particularity and complexity of the Cyclades case lies in the multiple layers of levels of action that need to be observed, the multiple identities of Syros and Tinos. It is not only that the two Cycladic cases are small or that they are islands, the combination of which would already be sufficient to make water management challenging. It is also that they belong to a national state, the decision-making center of which is on the mainland, far away from the islands. The national state is also a member of a multi-national federation of national states, the European Union, whose directives and laws are to be implemented throughout its area of jurisdiction.

The literature dealing with small societies has not really focused on the dynamics of policy making in small societies within bigger countries. What seems to be missing is a multi-level institutional perspective that can capture the dialogue between local and national levels and how that dialogue is defined by institutions, meaning in this case how these institutions define choice for society and its use of water.

Addressing this gap, and taking an institutionalist approach, in the next sections I introduce the key concepts needed to answer the research questions I have posed above. These concepts include *institutions* and the process by which they *change* as well as the *reasons* behind their change. *Transactions* (nature-related transactions and legal transactions) and the *interdependence* they cause or reveal between actors across various levels and locations (Hagedorn, 2015) will also be discussed. Finally, the concept of *remedy* will also be introduced.

## 3.2 Conceptualising Institutions

This subchapter considers approaches to understanding and analysing institutions, with the aim of examining to what extent the institutional perspective can offer satisfactory answers to the research questions posed by this study.

As we have established in Chapter 2, water scarcity is constructed through institutions regulating aspects of water governance, from production/abstraction to transportation, distribution, access, allocation rights and so on. Institutions define choice for society and its use of water.

### 3.2.1 Understanding Institutions

Issues related to institutions and institutional change have been incorporated into economics by various schools of thought. In what follows, I present the main approaches to institutions and institutional change relevant to the purposes of the current study.

One influential scholar in institutionalism is North (1990), for whom institutions "*are the rules of the game in a society, or more formally, are the humanly devised constraints that shape human interaction*" (ibid, p.3). Institutions, according to North, are external constraints for individuals, whose goal is to maximise their utility. From his perspective, the individual is a rational agent, with stable preferences, unaffected by external factors, and complete information, constrained by rules that strictly define his action sets (institutions). In order to maximize their utility, individuals inter- or transact with others. These transactions are not, however, without cost in terms of resources and time. Consequently, institutions are created as tools to regularise transactions, with the more or less conscious intention of eventually reducing their costs. However, a closer look also reveals an 'enabling' character of institutions in North's definition. In this vein, Hodgson (2006, p. 2) uses the example of traffic rules as both *constraining* a driver's behaviour while simultaneously *enabling* easier and safer driving.

According to some other scholars of institutionalism, the *collective* is important, and institutions are not perceived as constraints but rather as enablers of realms of choice. For Commons (1924), institutions are legal relations a) between individuals and b) between individuals and the state. Bromley (1989) defines institutions as "*rules and conventions of society that facilitate coordination among people regarding their behavior*" (p.22). For classical institutional economics, institutions are purposefully constructed by the collective, with the purpose of altering interactions between members of a going concern, which is best understood as a collection of activities, forming a community, coming together for a *shared purpose*. As defined by Commons, a going concern is "animated by a common purpose, governed by common rules of its own making, and the collective behavior in attaining that purpose we distinguish as 'going business'" (1924, p. 145). A going concern can be a firm, a nation, a family, a village, essentially any group of people coming together motivated by a shared belief. As Ramstad put it, going concerns are "concerted action for ends foreseen in the future" (Ramstad, 1990, p.74). They are "essential in how the world makes sense to people. Going concerns also give rise to shared ideas about what is important" (Hiedanpää and Bromley, 2016, p. 108).

Vatn (2005) agrees with Commons and Bromley when he sees institutions as socially and purposefully constructed, offering a typology of them according to their form and motivation. Institutions are thus "*the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularize life, support values and produce and protect interests*" (Vatn, 2005, p.60). Conventions (like language) address and simplify simple coordination problems. Norms differ from conventions in their incorporation of values and are viewed as socially created and internalised rules to define and support values in a situation with conflict potential. The last category, formally sanctioned rules, combine *a)* an act which is either allowed or forbidden with *b)* an agent or a system with sanctioning authority. This third category is referred to by Commons (1924) and Bromley (2006) as legal correlates (dualities), the purpose of which is to create order and resolve conflicts. As Bromley stresses, these institutions "carry the expectation of legal sanction" (*ibid*, p. 51).

Such institutions –legal correlates- define what individuals "must or must not do (duty), what they may do without interference from other individuals (privilege), what they can do with the aid of the collective (power) and what they cannot expect the collective to do in their behalf (no right)" (Bromley, 1989, p. 43).

Table 10: The legal correlates

| **Legal Correlates** | | | |
|---|---|---|---|
| | ALPHA | ← → | BETA |
| Static Correlates | Right | ← → | Duty |
| | Privilege | ← → | No Right |
| Dynamic Correlates | Power | ← → | Liability |
| | Immunity | ← → | No Power |

*Source:* Bromley, 2006

Basing himself on Hohfeld's fundamental legal relations, Bromley elaborates on the possible legal relations (correlates) between one social entity (Alpha) and another social entity (Beta). Social entities might be individuals or groups of individuals. Recall that these correlates only take effect in the presence of a legal system with sanctioning authority, so one cannot talk of legal correlates within norms or conventions, since no enforcement mechanisms are in place for such classes of institutions.

Keeping the above in mind, a *right* held by Alpha is a "state-sanctioned and enforced expectation and assurance that Beta will behave in a certain way towards Alpha" (Bromley,

2006, p. 52). This means that Beta has a *duty* to behave in a certain manner towards Alpha. If Beta does not uphold that duty, then Alpha has the right to call the collective to come to her aid. The second legal correlate is that of privilege–no right. If Alpha holds a *privilege* with regard to Beta, then Alpha can act without considering what the effects of her actions might be on Beta. Alpha has the privilege of acting without consideration and, therefore, puts Beta in a position of *no right* and has no prerogative to call the collective to his aid, since "privilege is a situation of no-law" (ibid, p. 53). Beta is thus at the mercy of Alpha.

To have *power* is to be able to force others into a legal situation against their will. When Alpha has power, she can enlist the coercive power of some authority to impose her will on Beta's choice domain. In this case, Beta suffers from liability to Alpha's power. In a case where Alpha is unable to force Beta into a legal situation he would not like to be in, then we can say that Beta enjoys *immunity* and that Alpha is in a position of *no power*.

One can identify many similarities shared between Bromley's legal correlates and Hagedorn's (2015) integrative and segregative institutions (ISI). Although they both refer to transactions and interdependencies between actors, their point of departure is different, but complementary. Bromley is looking at legal relations (legal transactions), whereas Hagedorn (2008, 2015) is concerned with taking a physical perspective on transactions, tracing the origin and creation of institutions in nature-related ones. He holds that, in nature-related fields such as agriculture, it is actor characteristics and transactions properties that interact and, consequently, effectuate institutions. Based on the consequences of actor decisions leading to transactions, Hagedorn further distinguishes between integrative and segregative institutions governing them.

Table 11: Physical view on transactions: integrative and segregative institutions

| **Physical View on Transactions** | **Integrative Institutions** | **Segregative Institutions** |
|---|---|---|
| Beneficial effects | Appropriate all benefits and leave no gains to others | Forego some benefits and leave gains to others |
| Adverse effects | Accept all liability and shift no nuisance to others | Deny complete liability and shift nuisances to others |

*Source*: Hagedorn, 2015

Integrative institutions hold decision makers accountable for virtually all transaction consequences, while segregative institutions free them from some of the costs induced by the transaction. Hagedorn (2015) links transaction characteristics to the requirements for

institutional design, arguing that nature-related transactions, being complex and interconnected, require that the trade-off between segregative and integrative institutions be considered if sustainable interaction outcomes are desired.

Integrative institutions achieve "consensus and legitimacy by deliberation and rational debate" (Skogstad, 2003, cited in Hagedorn, 2015, p. 594). Consequently, one can identify a congruency between the social and physical perspectives on intergrative and segregative institutions, derived from the physical and social perspectives on transactions.

Table 12: Impact of integrative and segregative institutions on transaction costs

| **Physical View on Transactions** | **Integrative Institutions** | **Segregative Institutions** |
|---|---|---|
| Internalising transaction costs | Duty to internalise | incomplete duty to internalise |
| Externalising transaction costs | No right to externalise | Some rights to externalise |

*Source:* Hagedorn, 2015

As Hagedorn (2015) notes, the more complex, nature-related and interconnected transactions are, the more integrative institutions need to be to address this complexity at the social level. Hagedorn further draws attention to the possibility that congruency between institutions and transactions will not always be entirely symmetric. Oftentimes, socially integrative institutions are not directly associated with physically integrative institutions, and vice versa. In such cases, communities might collectively decide that they can tolerate some nuisances caused by entrepreneurs if their activities would translate to other benefits for the community, such as employment for example.

One can easily identify this situation of asymmetric congruency on the two selected islands where, to a large extent, the local communities accept the actions of the tourist sector (of which they are also a part) because the benefits it brings to the islanders outweigh the perceived nuisances of water scarcity. There is apparently sufficient reason for the community to accept deviation from the optimal balance between social and physical realities.

Regarding water sector dysfunction facing these islands, the correlates within legal relations and integrative–segregative institutions will be important to note when we examine the water sector and examine which actors holds which legal correlates, how the water sector dysfunction is related to the integrative or segregative nature of existing institutions and what implications these factors may have for rectifying the dysfunction.

### 3.2.2 Institutional Change

Institutional change is the creation of an institution in an area where no institution had previously existed or the replacement of an existing one. Theories of institutional change address questions of both how and why an institutional status quo changes, approaching them through different perspectives. Some theories start off from the assumption that change is spontaneous or designed, while others make a distinction between whether it is initiated by the "top" or the "bottom" of a hierarchy.

North (1990) approaches institutional change as a means to reduce transaction costs, via state monopoly on regulation and coercion. The state, through its regulatory and coercive power, creates and sustains institutions and markets, thus creating a stable structure for human interaction and, consequently, reducing uncertainty.

Vatn (2005) proposes a typology of reasons for which institutions change in cases of designed institutional change, based on the following three grounds: a) *efficiency*, meaning reduction of transaction costs and uptake of technological advancements; b) alignment with *interests, values and power*; and c) *response to crises* and shocks. According to Vatn, efficiency (reduction of transaction costs) is achieved through protection of present or future benefit streams through establishment of property rights. The question of who will be granted those rights is a question of whose interests are protected and advocated and whose interests are denied. The last ground upon which institutional change is predicated is that of response to crisis, as adapting to a crisis generally requires new institutions. Vatn (2005) cautions, however, of the possibility that crises might legitimise changes that would otherwise not be accepted.

Bromley and Anderson (2012) propose that change occurs because the status quo ante is not working as expected. Change as a result of *human volition* is the focus of Bromley (2006), who views institutional change as deliberative action occurring when a surprising event takes place and doubt needs to be settled. The surprising event might be, for example, that the current institutional status quo fails to "conduce to agreeable outcomes" (ibid, p.35). Created and available imaginings regarding the future are evoked in terms of the volitional nature of institutional change. Institutional change then becomes public policy in its conception and implementation.

Hagedorn (2015) explains institutional change using the concept of the transaction-interdependence-institutions-cycle (TIIC) explicating the causal relationship (nexus)

connection between transactions and institutions. According to TIIC, by causing interdependence between actors, transactions affect social relationships. As a result, we can observe the emergence of institutional change – either by design or unintentionally – in response to conflicts or opportunities for cooperation arising from the consequences of physically grounded transactions.

It is in this way that we are now reminded of the particularities of islands. Physically grounded transactions have cascading effects that influence and are visible not only to islanders themselves (owing to the "discontinuity of space" and geographical "isolation" of islands) but also flow to the mainland, where they may be addressed by officials and legislative bodies at the national level. Islands thus offer a perfect setting where the interdependencies between the social and the ecological can be studied.

Applying the TIIC (Fig. 9) to the Cycladic water sector, we can postulate the following sequence of events around the nature-related transactions surrounding water usage:

1) Individuals, predominantly farmers, abstract groundwater, oftentimes without permit.

(2) The groundwater table deteriorates, resulting in water availability is reduced.

(3) Sea-water intrudes into the groundwater.

(4) Salty water reduces agricultural productivity, leading farmers to turn to local officials requesting support, either financial or regulatory.

(5) Local officials regulate water provision through water cuts to households, due to limited water availability.

(6) Farmers, household water users and officials recognise their interdependence regarding the use of water.

(7) This stimulates interaction between actors directly (water users) and indirectly (politicians), such as discussion, negotiation and consensus building on rule making.

(8) Adaptation processes in the social system (e.g., regarding rules and organisation of water quality and regulating abstraction rates) result in institutional change and governance reform.

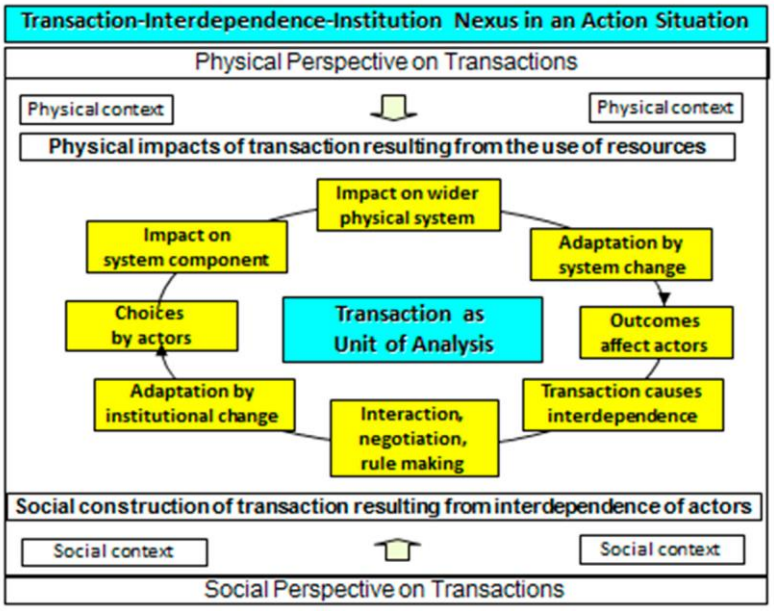


Figure 9: The transaction–interdependence–institutions cycle
*Source*: Hagedorn, 2015

What becomes clear here is that actors react to consequences of physically grounded transactions, what Hagedorn calls nature-related transactions. Human behaviour is, thus, influenced by attributes of the "biophysical and material world being acted upon or transformed" (Ostrom, 2005, p. 22). It is the nature-related transaction that acts as the surprising event referred to by Bromley that motivates individuals to realise that something is not working properly in the institutional status quo. So consequences of physical transactions activate action situations.

## 3.3 Legal Rules and the Importance of Remedies

We have already taken a brief look at legal rules and legal relations in the subchapter on institutions (3.2.1). Here we revisit these concepts and elaborate on them further. Legal rules are working rules (institutions) of political concern (Stupak, 2014; Bromley, 2006; Commons, 1924). Recall that working rules specify the allowed and prohibited domains of action for individuals and, thus, define the domain of choice for the whole society. For the present study, institutions are seen as social constructs that define choices within a going concern, whether it is a family, community, firm, nation, or an island society. Going concerns operate within the boundaries set by working rules, and three sets of working rules setting the boundaries of three types of going concerns can be distinguished. A political going concern (such as a state) operates within boundaries set by legal rules. An economic going concern

(such as a firm) operates within boundaries set by contracts. And, finally, a moral concern (such as a family) operates within boundaries set by norms and conventions. Although we will be touching upon all three types of working rules, we will mainly focus on the interplay between working rules of political concern (legal rules) and those of moral concern (norms and conventions).

As we have seen, legal rules (and indeed any institution) include the notion of correlates, of dualities, meaning that they define what individuals "must or must not do (duty), what they may do without interference from other individuals (privilege), what they can do with the aid of the collective (power) and what they cannot expect the collective to do in their behalf (no right)" (Bromley, 1989, p. 43). Legal rules – translated to correlates of right–duty, privilege–no right, power–liability, immunity–no power – influence to the ability of the individual to call on the collective (state) to come to her aid. We have examined how working rules, in the form of legal rules, establish legal relations between members of a going concern and very briefly discussed rights and duties, powers and liabilities. In what follows, I develop these concepts further and relate them to the discussion in section 3.1.3 on the "discretion" of officials.

A right is one of the core legal concepts, and clearly assigned and defined rights, especially property rights, have long been considered as the solution to many resource-related problems, such as groundwater degradation. Hardin (1968), for example, famously argued in favour of the assignment of private property rights as the way to save pastures from over-grazing. To hold a right is usually understood as being permitted to act in a certain way. There is, however, more to a right. As mentioned above, a right is also an expression of relationships among members of going concerns. A right exists always and only in relation to (is correlated with) a duty. The right of Alpha is correlated with the duty of Beta (Bromley, 2006; Commons, 1924; Hohfeld, 1917). To have a right thus means that someone else has a duty to respect it. Rights can be protected and duties can be enforced through a third authoritative agent, which is usually the state or the government.

Hohfeld identified three classifications of legal relations that have had implications on how they should be approached in analysing them. Commons (1924) summarises these as the approach of a) "the legal practitioner […] before the court", b) "logical, mathematical or syllogistic relations existing between legal concepts", and c) "the supreme court, a legislature, or an economic inquiring. What are the limits and purposes of society's working rules themselves, and what are the economic or social consequences of a particular legal relation

created by a particular type of conduct?" (p. 91-92). It is the third approach that has implications for our study.

Here I am particularly interested in the relationship between right and duty and how it comes into effect. A right and a duty remain abstract concepts until a third party enforces them. A third party is needed that has the authority over both duty and right holder. In the absence of a "powerful" third party, disputes would likely be resolved via violence or extensive negotiations. And still a great amount of trust would need to exist between the parties that the agreement would be bind together. This is why an authoritative third party with the ability to guarantee rights and duties is needed. The role of this authoritative agent is assumed by the state and it is spelled out in the rulings of courts, parliaments and legislatures.

Rights and duties do not come out of a vacuum but are rather set through the legal correlates of exposure and privilege, respectively. A privilege is the "field where the behaviour is unrestrained or uncompelled by authority" (Common, 1924, p. 99). With privilege, there is no lawfully wrong act; there is no law regulating that sort of behaviour. If Alpha acts with privilege, he may visit harm on others who suffer under exposure and have no ability to call on the collective to come to their aid. Privilege and exposure indicate the limits of law's reach. To be operational, these correlates (rights/duties, privilege/exposure) must be supported by/through authoritative relations. As we have seen earlier, authoritative relations exist between legally superior and legally inferior agents and are determined by the power–liability and immunity–no power correlates mentioned by Bromley (2006).

The authoritative agent (government) is not free to do as it pleases either, as it acts according to the power and liability assigned to its officials. Power is the ability to force others in a position they do not wish to be. In the case of public officials, they have the power to force members of the going concern that is society to perform their duties. And the members of the society (duty holders) are obliged to comply. The power–liability correlates also mean that citizens can call on their officials (representing the collective) to come to their aid. Officials are then liable for executing the rights of citizens and, essentially, have a duty to do so.

Recall that rights and duties exist only if they are supported by an authoritative agent and more specifically by the "remedial power–liability relation" (Commons, 1924, p. 109). Commons explains:

"In one sense the right does not exist as a "fact" before either it or its *remedy* is exercised – but, if so, then the "fact" is only a mental process, a hope, a fear, an expectation that since a certain working rule has been applied in the past, it will be applied again in similar cases" (ibid).

He insists here that, without the authoritative remedial relation, rights and duties are mere wishes or ethical assertions; they are not a legal fact. So, according to Commons, we see that rights and duties are actually determined not by what is written but by the actions of public officials implementing laws. He explains further that:

"remedy is none other than the *activity of officials* setting the machinery of government in motion, and getting one set of officials responsible for enforcing what *they define to be the rights in the case.* If the officials are corrupt, negligent, incompetent, biased, or revolutionists, the legal right is nevertheless exactly the equivalent of what they do or may be expected to do, and practical sophisticated men, without illusions, act accordingly, although ethically they may condemn the situation" (Common, 1924, p. 110-111, emphasis added).

So, here we see an emphasis on the vital importance and functional role of remedy – the activity of officials setting the machinery of government into action – in determining what actually constitutes a legal rule. Two aspects emerge here as being relevant for this study. The first one is that remedy is a precondition for the existence of a right. Without remedial power, a right is a mere wish, as Commons (1924) emphasised, a fear or a hope. It does not effectually exist in the legal realm. The second relevant aspect is the question of who holds and exercises that remedial power. It is the officials of the state, and not the legislature, that "define […] the rights in the case" (Commons, 1924, p. 110), as the law needs to be implemented in order for it to be effectual. An unimplemented law is a non-existent one, as it has no effect over the society whose scope of action it aims to alter. We see, then, that "when there is no remedy, there is no right" (Commons, 1924, p. 110).

Public law for institutionalists, and Commons in particular, is the procedure designed to enforce responsibility upon officials. In accordance with the dual nature of legal correlates, the responsibility of officials in none other than the liability of citizens to fulfil their duties. At the same time, officials are also liable to be "acted upon through judicial mandamus or injunction, through legislative impeachment, through executive removal from office, through popular election or recall" (ibid, p. 111). This procedure is undertaken and safeguarded by governments or by the state that essentially represent the "legal order". As Commons notes,

"[s]ince, however, government and the legal order are behavioristically none other than the officials-in-action, we speak of it as simply officials. The correlative of the power of officials is the liability of other officials" (1924, p. 111).

Public officials become, then, an important agent in the implementation and enforcement of legal rules and an intermediary between the will of the state and its citizens.

We turn now to transactions, which are a means for explaining the emergence, enforcement and change of institutions.

## 3.4 Transactions

A transaction, as an object of study, is defined and used differently by different disciplines. In might be understood as the exchange of commodities, as the transfer of a good or service across technologically separable interfaces (Williamson, 1985), or as a "physical phenomenon that is induced by a decision of one or more actors and affects one or more actors" (Hagedorn, 2008, p. 363). Commons (1934, p. 55) defined the transaction as "the unit of economic activity" and further "the smallest unit of institutional economics" and "the alienation and acquisition, between individuals, of the *rights* of future ownership of physical things" (ibid, p. 58).

I elaborate here on both the *physical and legal definitions of transactions*, as these two approaches are complementary and not competing, as already established in section 3.2.1 on the conceptualisation of institutions. The first focuses on physically grounded institutional change, through the interdependence of nature-related transactions caused by actors, thus affecting social relationships and ultimately leading to institutional change (Hagedorn, 2008). Meanwhile, the latter is concerned with analysing the processes for creating new institutions, involving the alienation and acquisition of rights to future ownership of physical things (Commons, 1934).

### 3.4.1 The Physical View of Transactions

A nature-related transaction consists of "economically relevant processes by which goods and services, resources and amenities, and damages and nuisances are allocated" (Hagedorn, 2008, p. 360). All transactions have properties such as frequency, uncertainty, and asset specificity, which are connected to frictions between various activities (Williamson 1996).

In complex, nature-related systems such as agriculture and water supply, nature-related transactions have further properties related to achieving coherence between human activities

and biophysical processes (Hagedorn 2008), including excludability, rivalry, asset specificity, frequency, uncertainty, complexity, heterogeneity, jointness and legitimacy (Hagedorn et al, 2002), as described in Table 13.

Table 13: Properties of nature-related transactions and their description

| | |
|---|---|
| Excludability | Difficulty of preventing actors from accessing benefits of a transaction |
| Rivalry | Degree to which goods or services consumed in a transaction reduce the resource available for others |
| Asset specificity | Degree to which investments can be redeployed |
| Frequency | How often transactions occur |
| Uncertainty | Certainty in action–outcome linkages |
| Complexity | Degree of interconnectedness in factors leading to outcomes |
| Heterogeneity | Variation in spatial characteristics or other physical stochastic phenomena |
| Jointness | Ability to separate one transaction from another |
| Legitimacy | Whether affected actors view transactions as legitimate |

*Source:* adapted from Hagedorn et al, 2002

Modularity of structures and functional interdependence of processes related to a specific transaction are key attributes that further enable the classification of nature-related transactions (Hagedorn 2008). Modularity captures the decomposability of processes in self-contained sub-processes (Roggero and Thiel, 2017), denoting the capacity of subsystems to perform their activities with little interaction with other modules. Functional interdependence refers to how changes in the state of one module affect changes in the state of the other modules in a system. Combinations of these two attributes result in four types of transactions, ranging between two extremes: atomistic-isolated transactions, which are characterised by high modularity and low functional interdependence, and complex-interconnected transactions, for which low modularity and high functional interdependence are common. The properties of the different transaction types can be accounted for differently by various institutions and governance structures (Hagedorn, 2015).

Yet, as Roggero and Thiel (2017) note, transactions between highly interdependent activities can still be *modularized* through rules such as technical standards (Baldwin, 2007). By shaping mutual expectations, rules (institutions) greatly decrease the effort necessary to

coordinate highly interdependent activities across different units of the same organization. This last point leads us to review the legal view of transactions.

### 3.4.2 The legal View of Transactions

Transactions are not, then, limited to the exchange of goods but also acquire a legal status as well. Commons defined the transaction as the "*alienation and acquisition, between individuals, of the rights of future ownership of physical things*" (1934, p. 58). He established a three-way classification scheme for transactions – bargaining, managerial and rationing – and assigned a negotiational psychology to each (see Table 14). *Bargaining* transactions occur between four or more legally equal parties and are concerned with "the legally sanctioned transfer of ownership over future net benefit streams" (Bromley, 2006, p. 38). The four potential parties of the bargaining transaction are the successful seller, the successful buyer, the disappointed seller and the disappointed buyer. Commons sees two strategies in bargaining: coercion and persuasion. Persuasion is a strategy both participants will employ when their bargaining power is equal. In most cases, however, although the participants might be equal in the eyes of the law, they are generally not be equal in their actual bargaining power. Thus, we might expect to see coercion in cases where one party enjoys economic or political superiority over others.

Table 14: Transactions and their corresponding negotiational psychology

| **Types of transaction** | **Negotiational Psychology** |
|---|---|
| Bargaining | Coercion and Persuasion |
| Managerial | Command and Obedience |
| Rationing | Pleading and Arguments |

*Source:* Own graphic based on Commons, 1934

Commons further distinguishes between managerial and rationing transactions. *Managerial* transactions are concerned with the creation of wealth, not the distribution of it, and occur between two legally unequal parties within a hierarchy, and not four, as in bargaining transactions. They involve, for example, an employer and employee, where the employer gives orders and the employee executes them. The negotiatonal psychology here is one of command and obedience (Commons, 1950, 57). At times, there will be disagreement on what constitutes reasonable demands from the employer and reasonable obedience from

the employee. If such disagreements reach the level of requiring formal resolution, will be resolved by the law-setting bodies, whose judgement will change depending on what is considered "reasonable" at any given point of time.

*Rationing* transactions are involved in the "negotiations of reaching an agreement among several participants who have authority to apportion the benefits and burdens to members of a joint enterprise" (Commons, 1934, p. 68). Such transactions are policy-shaping, as "the rationing of wealth or purchasing power, not by parties deemed equal, but by an authority superior to them in law" (Commons, 1934, p. 68). Negotiations over the rationing of future wealth or benefits, occurring in legislatures or parliaments and courts, entail the ideas of pleading and argument and involve reason giving. Rationing transactions not only set up the working rules upon which bargaining and managerial transactions are based, but they are also the necessary condition for institutional and policy change. As Bromley notes, "[w]hen I say that new public policy is a new collective action in liberation, restraint, and expansion of individual action, it is the rationing transaction that embodies (captures) this idea" (Bromley, 2006, p. 40).

Bromley and Hiedanpää (2014) have further expanded Commons' typology of transactions by including a fourth one, the *inducing transaction*, the purpose of which is to induce behavioural change, especially of habits. More specifically the inducing transaction aims to "bring about specific behavioral changes when the individual agent has no interest in altering those existing behaviors. There is nothing in it for her" (ibid. p. 10). They illustrate this newly conceptualised class of transaction by employing Payments for Ecosystem Services as an example where a potential seller approaches a group of potential buyers and offers them economic incentives to alter their behaviour, that is to break an existing habit. This transaction occurs between a potential seller and a group of potential buyers, and Bromley and Hiedenpää emphasise that its purpose is not to make its participants equally better off but rather to induce change in the (here, environmental) behaviour of the "targeted" participant, the buyer. Habit breaking is not easy and can only persist when the beliefs of the buyer also change. Monetary incentives usually do not suffice. The inducing transaction is a new concept and has not yet been elaborated upon in a context outside of the Payment for Ecosystem Services scheme.

What is clear, and what Commons insisted upon, is that there is an *authoritative agent* in all transactions, because "if this superior […] third party is not believed to exist or to intervene then the relation of right and duty between the two [transacting parties] disappears altogether" (Commons, 1924, 84). He correlates authorised and authoritative relations with

*authorised and authoritative transactions*. According to this distinction, authorised transactions will occur between legally equal parties. For example, bargaining transactions between prospective sellers and buyers or rationing transactions between parliamentary members deliberating on a new law. Authoritative transactions occur between legally unequal parties, between a legally superior and a legally inferior, and their purpose is to ensure order in a society by enforcing conformance to legal rules. Authoritative transactions may occur between, for example, a water agency official ordering the owner of an illegal well to stop abstracting water from the groundwater.

Taking Commons' correlation a step further, we can see a clear relation between transactions, remedies and working rules. The *inalienability rule* implies that no bargaining (i.e. authorised) transaction may take place between imposing and exposed parties. On the other hand, property and liability rules do allow two parties to engage in bargaining transactions. Meanwhile, a *working rule* specifies whether a specific transaction is allowed or not, and under what circumstances, such as whether drilling for water from private wells is allowed to be sold or is only for its owner's consumption. Whether or not this rule will be actually enforced depends on the remedial power of the relevant officials. In the next section, we will address human behaviour as understood through the lense of institutionalism.

## 3.5 Behaviour and Institutional Economics

Individuals engage with their society in a world constructed by institutions to which they are indeed "habituated". The institutions that exist today are the result of the will of the authoritative agents of the past and, by coming into being, these institutions have shaped the institutional reality of today. Through experiencing a reality shaped by institutions, we become habituated, which also means that we can no longer claim to merely act on free will, as this would mean that we can readily dismiss the effects of institutional structures on the options available to us and their effects on our minds. Institutions shape the ways we perceive the world, our rights and duties, our sense of right and wrong, our expectations and our claims to benefit streams. Commons called this the "institutionalised mind" (Commons, 1934). We are, in fact, so habituated by the institutions surrounding us that it is only when the effect of an institution is undesirable, or becomes so, that we take notice of the causal relationship between working rules (institutions) and our actions. It is then that we may begin to contemplate how to change such institutions by asking what kind of desirable outcome we want to achieve in the future (Bromley, 2006).

We can then say that changing behaviour, changing the institutional structure that shapes behaviour, is precisely predicated upon first realising that the current institutional structure does not deliver what we – as a society – find desirable. It is only when institutions do not serve a useful purpose to us that we take notice of them and go about trying to change them.

Commons holds that institutional economics is ultimately about behaviour, especially the "behaviour of individuals while participating in transactions (Commons, 1934, p. 654). As illustrated in the previous subchapter, a transaction involves at least two parties and, hence, the psychology characterising the behaviour of participants in transactions is one of negotiation. In negotiational psychology, "[e]ach participant is endeavouring to influence the other towards performance, forbearance or avoidance. Each modifies the behavior of the other in greater or lesser degree" (Commons, 1934, p. 655).

With the term "negotiational psychology", Commons coined the mental process and associated activities of people as they engage in transactions. Key to understanding the centrality of negotiational psychology in Commons' view of transactions is looking carefully at some of its main features. *Futurity* is the term Commons chose to illustrate his belief that humans always act with the explicit aim of controlling or influencing outcomes in an uncertain future and that the meaning an individual attributes to a certain act lies in the expectations that individual may have on the action's future consequences (Commons, 1934). *Purpose*, then, becomes a central issue in the psychology of transactions, and purposes give birth to expectations.

*Expectations* also refer to expected actions of the other counterparts in a transaction. A transactor must "anticipate, account for and possibly influence the actions of others" (Biddle, 1990:3). Such actions on the part of others could either work as instruments towards achieving her own goals or act as barriers and obstacles (ibid). Most of the time, though, transactions are a matter of routine, as a certain level of certainty regarding expectations and behaviour of others is born from numerous similar transactions that the transactor had already been involved in in the past. This certainly is, at the same time, a result and source of the working rules of collective action, which have "injected order into transactions, providing the security of expectations that people needed in order to function on [a] day-to-day basis" (Commons, 1934, p. 704-705).

However, there is always some degree of *uncertainty* in any transaction, as there is always some scope of discretion available to transactors, who have opportunities to attempt to

influence each other. Moreover, transactors can never be entirely certain that they share the same understanding of given working rules with other involved parties and, thus, have even more reason to try to exert their own influence. If individuals want to achieve a certain purpose in the future, they need to *engage* themselves in transactions they are involved in, particularly if there are novel elements in them, and they need to *think* strategically if they want to advance their interests.

This is what lies at the heart of the negotiational psychology: negotiations between human wills in order to achieve each actors's desired outcomes in the future. As Biddle (1990) put it: "if the innovator [person introducing a new pattern of action] was to be successful, he would require the co-operation of some, the permission of others, the voluntary or involuntary inaction of still others. He would have to transact with the right people [...]. People would have to be persuaded, induced, coerced, convinced" (ibid, p. 7).

So, the behaviour of participants in transactions is not stand-alone, it is not purely individual. The negotiational psychology of institutions "resolves into the persuasions and coercions, the advertising and propaganda, of bargaining transactions; the command and obedience of managerial transactions; or the arguments and pleading of rationing transactions" (Commons, 1934, p. 31). As Bromley (2006) noted in his review of Commons' ideas about transactions, individuals differ in terms of their personalities or social or economic position and status and, hence, their ability to influence and carry out these transactions. This is corroborated in Biddle's (1990) examination of Commons' negotiational psychology, where he holds that the perceptions of transactors are as important as their objective conditions, such as the ones listed by Bromley (social positioning and economic status). These perceptions, Commons believed, are rooted in what he called *habitual assumptions,* which are "formed in the course of social interaction and maintained by social sanction" (Biddle, 1990:14). These assumptions are the core beliefs held by an individual, which shaper her representations of what should constitute a desired outcome. In Biddle's words, "Each participant's negotiational psychology had its roots in his habitual assumptions" (1990:16).

At this point, the following questions arise: What happens when the public officials engaged in managerial and/or rational transactions do not exercise their remedial power as planned? Why would they not do so? To answer these questions, we need to briefly reconsider a concept discussed earlier: reason. As I have already established, reason is a vision of the future, looking towards the future that one wants to achieve. To quote Bromley,

"actions are both explained and justified in terms of the future states they are expected to brings about" (2006, p. 6). An individual undertakes an action in the present to experience a desired for outcome in the future or to avoid an unwished one in the future. We act now, looking towards the future. So, when deciding on the action, an individual also makes a decision regarding what achievable or avoidable future outcomes ought to be. Additionally, the behaviour of an individual, if it is to be purposeful – as it has to be if it has a reason – needs to include the following elements, laid out by Bromley: a) "*belief* by the performer of the act X in the law 'if X, then Y'", b) "desire by the performer of the act X that Y (the outcome) indeed occurs", and c) "implementation by that desire and that belief jointly, of the act X" (2006, p. 112-113).

So, the basis for any action is belief that the desired action will yield the desired outcome. Bromley (2006) develops a theory of how these beliefs are formed in the domain of collective action. The policy process operates based on whether policy makers accept various truth claims (assertions or imaginings) put forward by scientists as being reasonable or not, as legitimate or not. Policy makers will then tend to act upon these truth claims based on whether or not they are seen as legitimate. There are two categories of legitimacy: a) within the scientific discipline and b) as accepted by an intended audience. The first category is termed "warranted belief" and the latter "valuable belief". Warranted belief "concerns the provenance, veracity and coherence of such claims as judged by the shared standards of disciplinary practices from which they spring" (Bromley, 2006, p. 130). It is a "benediction bestowed by the wider members of a discipline, not simply by those responsible for producing those assertions" (Bromley, 2006, p. 149). When the wider discipline cannot offer its consensus on a truth claim (assertion), then this assertion loses its legitimacy (warrantability). If the wider disciplinary community reaches a consensus on the truth claim, however, then we can speak of a warranted belief that policy makers would have no reason to doubt the legitimacy of. However, internal acceptance of assertion is not a sufficient reason for its acceptance. Valuable belief has to settle. This happens when members of said scientific community can justify their assertions to the broader public towards whom assertions are directed. The public may or may not be convinced of the value of the claim and can, thus, reject it. Once the assertion is accepted, however, it becomes a valuable belief – one upon which people may be ready to act. Once valuable belief settles in among non-expert members of the public, policy change can commence.

The process of arriving at action directed towards institutional change is illustrated by figure 10 below.


Figure 10: A theory of action
*Source:* Bromley, 2006

So, when going about answering seeking to answer the question of why the dysfunctional water sector in the Cyclades is difficult to rectify, we must first understand what motivates the behaviour (actions) of the main actors engaged in trying to improve the functioning of the water sector. The following statements and concepts guide the conceptual framing of the current study:

i. In small societies, and more so in island societies, the acts of public officials (through remedy) represent the will of the state. The official stands in for the state, because of the remedial power granted by it to officials.

ii. Behaviour is driven by reason (what is reasonable or not, what is desirable and what not), and it is based upon reason that actors engage in transactions.

iii. Public officials and other citizens act within their fields of discretion as dictated by legal rules.

iv. Human behaviour is habituated through institutions.

## 3.6 Analytical Frameworks

### 3.6.1 Analytical Frameworks in Institutional Economics

Analytical frameworks can be understood as constructs bounding "inquiry and direct the attention of the analyst to critical features of the social and physical landscape. […] frameworks organize inquiry, but they cannot in and of themselves provide explanations for, or predictions of, behaviour and outcomes" (Schlager 1999, p. 234). They are developed around a specific set of problems and are influenced by the "theoretical and empirical background of their producers" (Hagedorn 2013, p. 4). They are useful to researchers as they specify the variables of interest and the relationships between them thus providing the basis for theory development (Schlager, 1999). In turn, theories explain actors' behaviour and the related outcomes.

Various analytical frameworks have been developed for the study of social-ecological systems. Binder et al. (2013) and Hagedorn (2013) offered elaborated comparisons of the available research heuristics in the field. The Institutional Analysis and Development (IAD) and the Social-Ecological System (SES) frameworks developed by Ostrom and McGinnis (McGinnis and Ostrom 2014; Ostrom 2007, 2009) are among the most frequently employed frameworks. They appear helpful in analysing the use of a resource system by a group of actors, and are often applied in the case of common pool resources.

The Framework of Institutional Analysis (IAD) (Ostrom et al. 1994) was initially developed to guide empirical analysis of public goods provision and addresses decision making at the constitutional, collective choice and operational levels (Ostrom 2007, p. 22). It guides the analysis by operationalising interactions between actors (in the action arena), by incorporating exogenous factors and the outcomes of actions. A drawback of the IAD for the case of this study is that it is almost exclusively dealing with self-organising entities and is therefore unsuitable to address the multi-level and complex structure of the Cyclades water sector.

Another analytical framework was put forward by Hagedorn, Arzt, and Peters (2002) and further elaborated by Hagedorn (2008) and Hagedorn (2015) in order to help analyse the influence of transaction properties and the actors' characteristics on the emergence of particular institutions and governance structures. Titled Institutions of Sustainability (IoS), it embraces four core categories that pertain to human action and interaction in social-ecological systems: actors and their characteristics, transactions and their properties, institutions and governance structures. These categories become relevant when the actors enter particular action situations, in which they are confronted with a set of potential actions (Ostrom 2005).

Furthermore, the IoS framework structures analytically issues related to sustainability according to four main categories: a) transactions, b) actors, c) institutions and d) governance structures (Hagedorn, 2015). With the IOS (Figure 11), Hagedorn aims to emphasise the role of physical processes on causing, transmitting or accelerating externalities (effects -usually negative- of one's action to another individual). Governance structures represent organisational constructions for carrying out transactions (Williamson, 1996, p. 4-7). They differ with respect to their incentive and adaptive attributes and can range from classical markets to hierarchical organisation in the form of firms and public bureaucracies. Between the two extremes one can observe a diversity of mixed modes of governance (hybrids) (Williamson, 1985). Institutional alternatives, comparable in terms of their transaction costs

economising effects can be yielded when transaction properties are aligned with governance structures.

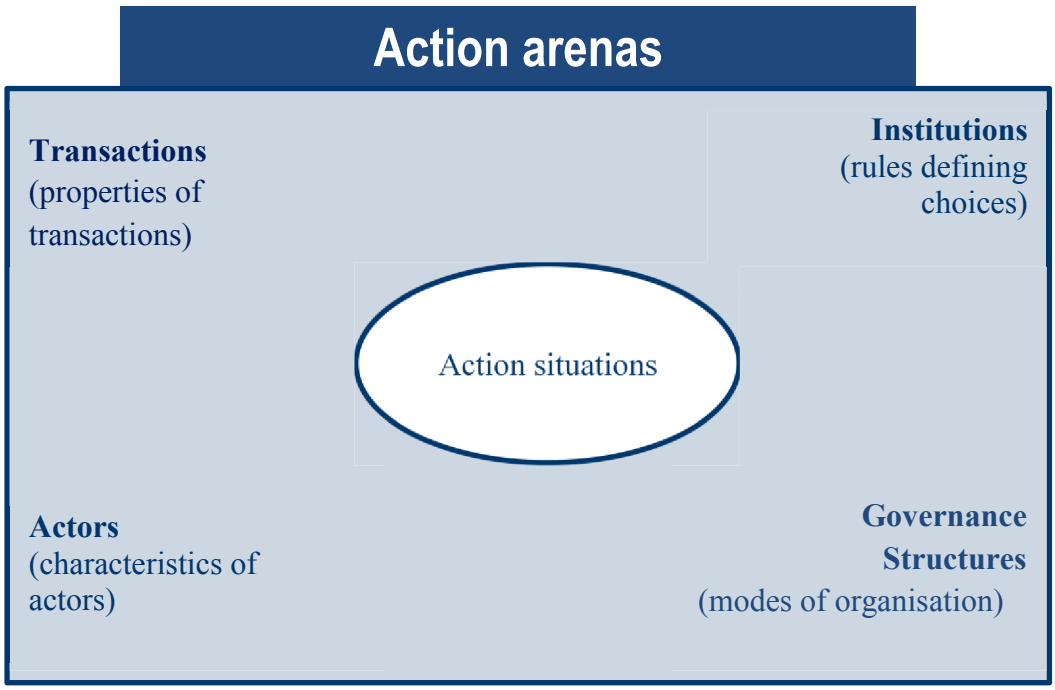


Figure 11: The Institutions of Sustainability Framework
*Source*: adapted from Hagedorn (2008)

Transactions are influenced by the physical attributes of ecological systems. According to the IOS, the only requirement for an action to be called transaction is that the actor affects another or others due to physical implication of her action. With the IOS framework, Hagedorn (2008) shows that nature-related transactions are strongly influenced by the attributes of the respective natural systems, which are characterised by complexity and interconnectedness (as it is explicated in TIIC).

Keeping in mind the social dimension of a social-ecological system, it is impossible to refer to properties of transactions as mechanical facts (Berger, 2015), neglecting at the same time the importance of social construction, which is influenced by the social dimension. When actors are confronted with action situations, they consciously decide which action they perform. It is here we observe the human will in action. It is here that we can look for reasons for human action. Having this in mind and based on the valuable insights gained by IOS, I will present the analytical components that will guide the diagnosis of the water sector in the Cyclades, emphasising on reasons for human behaviour.

### 3.6.2 The Analytical Framework for the Water Sector in the Cyclades

In previous sections, we have examined how the literature on administration and geography understands smallness, particularly insular smallness and how it influences public administration in island localities, its role within the society and the multiple – and overlapping – roles of public officials in such societies. A public official working, for example, in a department dealing with the approval or rejection of water use permits does not, in reviewing a permit application, act only within the field of discretion dictated by legal rules. It is quite possible that she will also act conditioned by being an acquaintance of the applicant or as a neighbour, a client, or even a parent of a student taught by the applicant. Roles in small societies overlap, and as I have established in our review of the public administration and nissology literature, it is very difficult, if not impossible, for a public official to disengage herself from her multiple roles when acting as an official of the state. Bureaucracies in small societies are not impersonal Weberian ones. In small societies, bureaucracies tend to be very personal indeed.

Both the nissology and administrative sciences literatures acknowledge the importance of smallness (in terms of overlapping roles and relationships) in moulding/shaping the behaviour of public officials. This concept resonates well with Commons' view that the acts of the officials are essentially expressions of the will of the state. So, by combining the overlap of roles in small societies[7] and Commons' remedial power of the official, we can claim that officials are an embodiment of the state.

Can the literature concerned with smallness and islands offer deeper insight into how the remedial power of officials functions when said officials have multiple, and oftentimes conflicting, roles to fulfil? What, for instance, are the limits of officials' remedial power? Is there room for them to manoeuvre and reconcile their multiple roles? Perhaps what was once conceived as such officials being slack is actually an act of reconciliation and acceptance of the multiple roles they are called upon to fulfil?

Institutional economics can, I believe, offer deep insights for understanding behaviour associated with the water sector dysfunction in the Cyclades, both that of officials and that of water consumers. It can do so by a) offering a framing through which to consider how to analyse the institutions liberating and constraining human action in the domain of water

[7] In this study, the terms small islands and small societies are used interchangeably, as small islands are small societies.

management in the Cyclades and b) offering a theory of human action based on beliefs. It is not enough to know that individuals' behaviour might vary due to the multiple roles they hold; we must also understand the reasons behind their actions. What institutional economics has to offer in terms of explaining behaviour is the recognition of the domain of human volition that animates action. There is a reason for every action. Granting volition to individuals, and not undertaking a mere mechanical quest for their utility maximisation, makes every action undertaken by water users, every decision taken by officials and every legal rule decided upon by legislatures subject to explanation. There are reasons why water users drill illegal water wells; there are reasons why water officials might not strictly monitor illegal water wells; there are reasons why legislatures pass laws requiring that all water wells be registered and granted permits. At bottom, there are reasons for the dysfunction of the water sector in the Cyclades. So, by following the abductive syllogism and accepting that people act not only within the scope of the discretion laid out for them by institutions but also as volitional agents looking towards the future, then we will hopefully be able to unravel the tangle that is the water sector dysfunction in the Cyclades.

In order to proceed, we must attempt to understand a) the existing institutional structures of the study locations that habituate the minds of their inhabitants and set their scope of discretion; b) the ways in which officials exercise their remedial powers in such small societies, meaning in practice how operating within a small island society influences the exercise of such power; and c) the reasons why individuals involved in the water sector act in the ways they do by coming to know the visions that motivate their actions. To this end, the analytical toolbox (Fig. 12) to employed in the present study while diagnosing the water sector dysfunction in the Cyclades is based on understanding and explaining the following five pillars:

1. Institutional structure (working rules),
2. Remedial power of officials and its relation to smallness,
3. Reasons for the actions of individuals,
4. Influence of overlapping social relations and
5. Manifestation of islandness.

The theories examined so far suggest that working rules will be put in force via the remedial power of officials, and the public (water users) will generally react to these rules by either accepting or rejecting them. If the public find the working rules to be reasonable, then

they are likely to accept and implement it, whereas if they find them to be unreasonable, they may demand that they be changed, which could lead to institutional change.

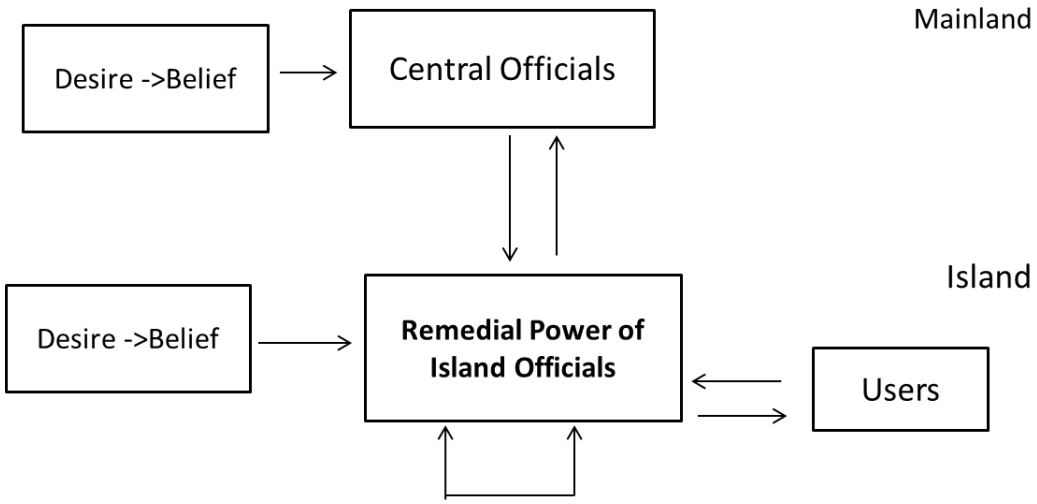


Figure 12: The analytical framework guiding the diagnosis of the water sector in the Cyclades
*Source:* own compilation

What we see in our case is that this circle is actually skewed when one takes into consideration the overlapping social relations prevailing in a small society, as is the case in the two small islands selected for this study. The boundaries between what constitutes a working rule and what not become blurry, and the personal beliefs of the officials – upon which their reasons for acting is based – become even more relevant, as it is not their hierarchical position but rather their relation to the recipients of the working rule that is likely to determine whether or not (or to which degree, or with how much flexibility) they will enforce a particular working rule.

Having that in mind, when diagnosing the water sector in the Cyclades, we will need to be sensitive to the cultural aspect of water management, to the context in which it takes place. As such, we will need to understand the socio-economic and spatial setting and explain the behaviour of individual actors participating in the water sector in the Cyclades. The reasons for the current state of dysfunction there will thus be sought in the domain of transactions amongst actors, of working rules regulating those transactions, and officials' remedial powers at all levels (national, regional and local), focusing foremost on island officials.

At each stage of the water sector in the islands, there are transactions occurring (Fig.10). Between central officials and island officials (authoritative transactions), between officials at the islands (authorised and authoritative), between officials and the users (authoritative) and

between the physical and the social dimension of the action arena. It is difficult and very laborious to track each social (legal) transaction and particularly each nature-related transaction in such a complex social-ecological system such as an island complex. There are many different actors acting simultaneously and it is not always feasible to track down with exact action led to which exact transaction and its effect. Instead, this framework and this analysis is based on the explicit assumption that the physical transaction triggers the action arena and that there are multiple interdependencies between actors, institutions and transactions that go unobserved. What lays in the focus of this analysis is understanding the reason for key-actors' behaviour, as it is only through understanding what motivates human action that we can offer prescriptions. It should be noted that in accordance with the abductive research strategy, which is the strategy selected for this study, the researcher engages in a "dialogue between data and theory" (Blaikie, 2010, p. 156) with the theory being developed and refined constantly. As a consequence, the analytical framework can only function as a construct bounding "inquiry and direct the attention of the analyst to critical features of the social and physical landscape" (Schlager, 1999, p. 234). As I will explain in the next chapter on methods, arriving at a satisfactory explanation for the dysfunctional water sector in the Cyclades, that is, developing a theory on the dysfunction of the water sector, will require an iterative process, one in which data collection, analysis and theory building alternate.

# 4 Methods

This chapter deals with the overall research strategy and design, the methodology and research methods employed, in order to answer the key concerns of this study, foremost being why the water sector in the Cyclades dysfunctional. Chapter 4 offers a comprehensive account of how data were collected, analysed and set in dialogue with the theoretical considerations developed in the course of conceptualising and carrying out the study.

## 4.1 Research Strategy and Design

For the purposes of this study, I have selected an *abductive research strategy* to guide the research process. Answering the question "why is the water sector in the Cyclades dysfunctional?" requires a deep understanding of the reasons behind the dysfunction, which includes touching upon the relationships and dependencies between actors and their socio-ecological system. Understanding "is the exclusive preserve of the [a]bductive strategy" (Blaikie, 2010, p.105).

*Abduction* – also referred to as a form diagnosis – is "a class of inference that yields explanatory hypotheses for observed phenomena" (Bromley, 2006, p. 96). With the abductive syllogism, one tries to explain the occurrence of a surprising event by creating and checking the plausibility of hypotheses. An abductive inquiry would commence with the observation of a surprising fact, one that is out of the ordinary. Let us call this suprising fact, C. The analyst would then go about developing various assumptions, or hypotheses – let us call them A – under which C (the surprising fact) would become a matter of fact, meaning it would not be out of the ordinary. In other words, using the abductive syllogism we can explore whether our hypotheses (A) can be seen as plausible explanations for the occurrence of the event in question (C). One can go far back as one wishes (or is able to) in trying to unravel the origin of the event such that the hypotheses (A) might end up becoming the event (C) in the next round of abduction.

If we apply the abductive syllogism to our case, the water-sector dysfunction in the Cyclades, the surprising event (C) that has attracted our attention is the interrupted supply and insufficient quantity of water on Tinos and Syros, called here the "water-sector dysfunction". Laws, bureaucracies and infrastructure are in place with the intention of securing uninterrupted water provision in sufficient quantity for the populace. So why aren't they delivering properly? Here I test various assumptions/hypotheses (A), seeking to offer

plausible explanations for this dysfunction. Is it, for example, due to shortage of the natural resource itself? Is it actually the case that the natural resource is present in sufficient quantities but is not made available because of managerial problems? Is the infrastructure not able to cover the entire area of these islands? If it is a matter of insufficient infrastructure, then this hypothesis then becomes the surprising event that begs to be explained. Consequently, the new question to be answered would be: why then is infrastructure insufficient?

As Blaikie notes, with the abductive syllogism "research becomes a dialogue between data and theory mediated by the researcher. Data are interpreted and reinterpreted in the light of emerging theory, and, as a result, change in the process" (2010:156). This inquiry (or "dialogue" in Blaikie's terminology) needs to continue until the analyst comes to a plausible explanation or until his/her toolbox does not enable any further analysis and until satisfying answers have been arrived at. Thus, what is characteristic of the abductive research strategy is that is iterative, demanding that the researcher become immersed for alternate periods in the relevant social world (here, the water sector in the selected Cycladic islands) and then withdraw from it for reflection and analysis. Data collection is done in distinct phases, allowing the researcher time to *understand* what has been observed, formulate plausible explanations (hypotheses) for it, and then return to the social world under study to refine the derived hypotheses.

It seems logical, then, to adopt the *case study approach* as the method for selecting sources of data on the social world under study for this research. There are numerous ways one can regard case studies: as a type of research design, as involving (usually) qualitative research methods, and finally as "a method of selecting the source of data" (Blaikie, 2010: 186). It is upon the last perspective that my own understanding and use of case-study is grounded. As Stake proposes, the "[c]ase study is not a methodological choice but a choice of what is to be studied" (2005, p. 443). As such, and based upon the abductive syllogism, the site of the case study then becomes the social world that may provide relevant clues for, in this particular case, unravelling the reasons for the water-sector dysfunction in the Cyclades.

## 4.2 The Case Studies

In section 3.5, I concluded that the investigation being presented here needs to focus on collecting data regarding actor actions, beliefs and motivations (on all levels), the

relationships between actors across levels (national and local) and the working rules that influence their scope of discretion. The two case studies (presented in detail in chapter 2.2) were selected as the "sources of data" for various reasons. First, Syros is the administrative capital of the Cyclades island complex and, as such, the seat of the majority of administrative organisations. Its water-related particularity is that it practically has no fresh water reservoirs and is exclusively dependent on costly desalination plants for its potable water needs as well as on increasingly expensive to drill salinized water for irrigation. Tinos, on the other hand, just 20km away from Syros as the crow flies, is a relatively water-sufficient island compared to others in the Cyclades, with agriculture being a dominant activity. Nonetheless, water quality concerns have been raised regarding the safety of the municipal water network, which adds a safety dimension to its particular dysfunction. Like Syros – and indeed like almost all the Cycladic islands – Tinos is increasingly relying on desalination plants.

Both cases studies are, I believe, representative in terms of the conditions necessary to characterise the water-sector dysfunction of the region: insufficient quantity, questionable quality and high prices. Given their proximity to each other, it also made the iterative collection of data feasible from an economic point of view, as it allowed me to frequently travel between the two islands.

The collection of empirical data was realised in three distinct phases. The first field visit was an exploratory one, conducted in July 2013, followed by a deeper and much more focused interview round in April of 2014 and, finally, the most "refined" and intensive interview round conducted in December of 2014.

### 4.2.1 Initial Sources of Evidence

Before going into the field it was important, as spelled out in the analytical framework in section 4.2 to collect information on working rules and on the reasons for actor's behaviour. This can be obtained from two sources: from documents and from accounts of actors involved in the water sector in the selected cases.

The first source (documents) comprises of legal documents indicating actors responsible for the water sector, setting legal rules regulating water use and protection, as well as rights to access to water and establishing the legal framework for transactions to take place. They also define the jurisdiction of administrative organisations operating in the Cyclades. By-laws and decrees were also considered in the document review conducted. Scientific publications on

the water sector of Cyclades were also considered, as well as information and expert opinions published in the media.

The review process offered a general understanding of water sector in the Cyclades, clarified the division of tasks and jurisdictions among different level of administration and clarified who the major and pertinent actors for this study were. Table 15 illustrates the officials identified as pertinent actors by the analysed documents.

Table 15: Officials operating in Cyclades

| **Officials** |
|---|
| Ministry of the Environment and Energy[8] |
| Special Secretariat of Water |
| Ministry of Agricultural Development and Food |
| Water Directorate of South Aegean |
| Prefecture of South Aegean |
| Municipalities (of Syros and Tinos) |
| Municipal Water and Drainage Company of Syros |

*Source:* Own compilation

Table 16 depicts the main water user groups identified as pertinent actors in Cyclades.

Table 16: Major water user groups in the Cyclades

| **Main Water Users** |
|---|
| Agricultural Associations |
| Hotel and other touristic lodging owners |
| Individual households |

*Source:* Own compilation

### 4.2.2 The Iterative Cycle of Interviewing and Theorising

The *first phase of the empirical work on this thesis which took place in July 2013*[9] was an exploratory one, whose aim was to roughly map out the problem at hand, verify that the

[8] It is very common in Greece that each new government reforms and restructures the ministries. At the time of the empirical data collection, the ministries had a different name and jurisdictions. Ministries and official organisations will be presented here with the name and jurisdictions they currently (March 2017) have.

problem that the researcher perceived as important (the dysfunction of the water sector) based on the literature review conducted, was indeed an actual, existing one which was of importance to the actors and the inhabitants of the islands. To this end, I visited both islands and had informal and non-recorded discussions with some officials and water users (households, small business, and agricultural users). It became clear from the discussions that there were indeed concerns about the provision in the islands, in terms of quality, quantity and cost, shared by everyone I talked with. The dysfunction was verified.

After returning to my office, I revisited the literature, in light of the newly verified dysfunction. The next step was to look for possible reasons for the dysfunction. These reasons could be grounded at physical or social traits of the water sector in the Cyclades, or most likely at a combination of both. Maybe the municipal water network was damaged, or did not cover the whole geographical expand of the islands. Maybe desalination plants were functioning below their capacity. Maybe water needs for tourism were greater than the ones the network could provide for. Or maybe users were simply wasting water, by consuming too much it. Maybe the municipalities overcharged for water, or charged too little.

These questions, together with others dealing with the different tasks each agency was charged with regarding managing the water sector were the focus of the *second phase of the empirical work, taking place in April 2014.* A first sketch of the analytical framework was drawn, and questions also included the applicability and suitability of European directives and national laws to the island context. Most of the interviews were conducted with officials at both islands, looking at the way the implement rules and regulations regarding water management. A few interviews were conducted with officials in Athens, the national capital.

What surfaced as a crucial determinant of the officials' behaviour was their perception of the rules and regulations as appropriate to the local island context: the spatiality of the case studies, the islandness emerged as a defining factor. Furthermore, there was a difference in way in which national and local officials prioritised water management, or rather in the way in which it was related to other aspects of social and economic life in the islands. National officials tended to be more objective/goal oriented, referring to the need to meet national obligations towards various European bodies, or fines that Greece is paying for failure to meet required goals. Local officials on the other hand, were relating water shortages or water

[9] There was an even earlier empirical round, in May 2012, which included a field visit and interviews in the Balearic Islands in Spain. At that time, the focus of the study was on the impact of the EU's Water Framework Directive on the water sector in small European islands. Following that field work, the focus was further refined and specified on the Greek Cyclades Islands alone, allowing for in-depth understanding of the problem at hand.

quality concerns much more to issues pertinent to the local (island) level rather than (inter)national ones. Actors at the national level have a different understanding what the dysfunction is and how it should be rectified, compared to the understanding held by the local officials.

It became then apparent in the course of that phase of the empirical work and also later during the reflection, that diagnosing (and subsequently rectifying) the dysfunction would require incorporating the island nature of the case studies: how islands societies operate as small societies, are influencing what an official can and cannot do (or finds it difficult to do, as we have seen in chapter 3. Institutions were coming together with small societies and islandness[10]. By this time it was also clear that the dysfunction was not grounded on a poorly-maintained set of infrastructures; making sure the infrastructures work (updating municipal network, or making sure that spare parts were quickly available for the desalination plants) would not solve the problem, because it went deeper than that. The dysfunction was strongly related to the actions/behaviour of the officials.

A further enrichment of the conceptual toolbox to include island geographies, island studies and small societies' studies, led to the development of the final analytical framework, in which smallness is related to the remedial power of the officials, and the influence of overlapping social relations are added.

The *third and final empirical phase took place in December 2014*, where interviews focused on the remedial power of the officials were conducted. Emphasis was also given to the multiple roles of officials at the local level, and their beliefs. Of course water users were interviewed as well, mainly focusing on what and how and by whom they thought was possible to change in the water sector.

Returning from the field and reflecting on information acquired during that time, it became clear that there rectifying the water sector in the Cyclades would take more than just ensuring that local officials implement rules and regulations coming from the national level. We will be discussing this on detail in chapter 5.

[10] As mentioned in chapter 4, island and small societies are used interchangeably in this study.

### 4.2.3 Field Research Protocol

Before each field trip, an interview guide was prepared, first in English to make sure that all pertinent theoretical concepts were included and then translated into Greek, in a more "empirical language" (Blaikie, 2010), with which the interviewees could more easily relate.

Interviews were planned as in-depth, so as to allow the respondents to express their beliefs, and interpretations of the status and future of the water sector and to freely elaborate on issues their perceived as important. An in-depth interview allows for a free flow of conversation between interviewer and interviewee and for the emergence of other topics that might be of relevance (Yin, 1994). Indeed, it is precisely because this format of the interviews (providing rich and detailed information on topics that were not covered in the interview guide) that allowed for the iterative theoretical refinement of the research focus.

There were three different sets of interview guides prepared, each corresponding to a distinct empirical phase. There was a common structure of the interview guide, with questions common for all interviewees which was complemented by specialised questions for different actors (users of different economic sectors, local and national officials). A template of the last interview guide, used in December 2014, is seen in Table 17. In all three empirical phase, a research journal was kept in which notes were taken regarding things that stack out; maybe an interviewee was reluctant to answer a specific question, or maybe on that day something particular happened that might influence the interviewee's responses. The journal was useful in the analysis of the interviews.

Table 17: Sample interview guide for the third empirical phase

| **Focus** | **Interview question** |
|---|---|
| Quality and quantity concerns / defining the problem | Do you think there is a water problem in the Cyclades islands? If yes, in which respect? |
| | Do you think there is a water problem in the specific island? If yes, in which respect? |
| | How important is this water problem[11] in comparison with other problems facing the island? |
| | How, in your opinion, was the problem created? |
| | What is being done to rectify it? By whom? Do you think this is sufficient? |
| | According to your opinion, what should be done to rectify the problem? |

[11] Problem here refers to the problem identified by the interviewee as important.

| | |
|---|---|
| Policies and regulations | Could you briefly describe the water management policy in Greece? |
| | Do you believe that current policies are sufficient to address the problem you described? |
| | Why, do you think, are policies as they are? |
| Policy implementation and Remedial Power | How are pertinent policies developed? Who is involved in the process? Are you? |
| | Do you think you are in a position to influence the design and/or implementation of the policies? |
| | In your opinion, are policies implemented as they should? |
| | Are your actions monitored? By whom? How often? Are there sanctions? Do you monitor others? Who? How often? Are there sanctions? |
| | Are you satisfied with the communication you have with central agencies and local actors? If not, what would you like to change? Why? |
| | Do you cooperate with other officials / actors? If yes, are you satisfied with your cooperation? If not, how would you like it to change? |
| | Thinking about your field of action, would you say that you are able to perform and behave as you would you like to? If not, what would like to change? |
| | Could you briefly describe what your tasks are? How are your tasks defined? |
| | Are you able to perform all your tasks as you should? Is there something you would like to change in your tasks and the way you perform them? |
| | What is for you a successfully performed task? |
| | If you could do anything, how would you rectify the water sector dysfunctions? What are the necessary steps forward? |

*Source:* Own compilation

In accordance with research ethics, each interviewee was given a project information sheet (Appendix 1) and an informed consent form (Appendix 2) to read and sign. If it was possible, the project information sheet was sent in advance via e-mail so that the interviewee had time to go through it and think about any issues that might have been of concern. The informed consent form functions as a sort of contractual agreement between the researcher and the interviewee. The interviewee, having being sufficiently informed about the project, consents to give information via an interview, and the researcher consents to ensure anonymity and confidentiality in the treatment of and use of the information obtained (Stupak, 2014).

## 4.3 Field Research

This section provides a detailed account of the context of empirical (research, of the interview process in itself and of the results obtained from it.

### 4.3.1 Rich Context of Empirical Research

"Context has been a central concern in qualitative inquiry from the start" (Holstein and Gubrium, 2004, p. 297, cited in Stupak, 2014). One of the basic premises of the analytical considerations underpinning this study is the habituation of individuals. We are conditioned by the working rules (institutions) of the society we operate in. It is important therefore to understand the context in which the actors live and behave, if we are to understand them, to interpret their messages in an informed and meaningful manner. This is particularly important when an interviewee tries to avoid responding to a question, or respond in an unsatisfactory way. Most importantly though, understanding the context enhances the researchers sensitivity and empathy with the interviewee regarding certain issues, and establishes a connection to the interviewee who might subsequently be more open to discussing sensitive issues. The research journal kept during the field trips supported the enrichment of the understanding of the context.

What is crucial in the understanding of the Cycladic context is that the data collection took place during the –ongoing- financial crisis and the harsh austerity in Greece. The crisis has deeply and profoundly shaped the context, not only in the two selected islands, but indeed in the whole country. All interviewees, without an exception, referred to the crisis at best as a barrier to any efforts done to rectify the water sector, but most commonly as a reason for its deterioration. As such, it is important that the reader understands what the interviewees mean when they refer to "the crisis" and what possible effects it has on the behaviour of actors.

It was –and still is- a period of political instability in the country, and most of all of doubt and mistrust to the political establishment. The three Memorandums of Understanding (MoU) between the Troika and Greece have had dire effects on the social fabric of Greece, on its economy and on the trust of the citizens to the political establishment ruling the country. Unemployment soared to over 30%, people at risk of poverty at over 33% and the GDP is shrinking (Eurostat, 2016). The drastic reduction of salaries and wages combined with a shrinking local demand and the excessive taxation of lower and middle class led to an increase of the public debt (Argitis and Michopoulou, 2012).

At the same time, the structural reform programmes heavily promote privatisations. So far, the country's biggest commercial and tourist ports have been privatised, international and peripheral airports, telecommunication companies, as well as part of the electricity company.

The water and sewage utilities of big cities (Athens -- EYDAP and Thessaloniki –EYATH) have already been partly privatised, although the country's highest court ruled their privatisation unconstitutional and ordered the Utilities being brought back into full public control. The subsidiary of EYDAP (EYDAP Nison – *Island EYDAP*) that is responsible for water provisioning of the Cyclades islands is on the list of the public utility companies to be privatised, further causing rifts in the already shaken trust of citizens to the national government.

Post-dictatorship Greek governments were formed almost in rotation by (the conservative) ND and (the social-democratic) PASOK that secured electoral wins with vote shares around 40% each, at any elections. This was the case until the elections of 2012, the first one since the first Memorandum of Understanding and the subsequent austerity measures. PASOK, the ruling party at the time, saw its vote share plummet from 44% in October 2009 to 13% in May 2012. New Democracy (ND) gathered half of what it used to. The smaller parties of the left, and SYRIZA (Coalition of the Radical Left) in particular, absorbed dissatisfied voters from the two (former) major parties. SYRIZA, from a 3% party saw its percentage drastically increased to 16% in the May and to 27% in the June elections. Teperoglou and Tsatsanis (2014) caution however against assuming that this shift is attributed solely to a punishment of the ruling party by the electorate. They argue that what happened to the Greek electorate goes deeper than that. They identified "open hostility towards the political class and specifically toward the two major parties" (op.cit, p. 2). This hostility can be attributed to two main factors. The first one is that the electorate was concerned about ceding sovereignty in key policy areas to institutions non-elected by it and held the ruling parties responsible for that (Teperoglou and Tsatsanis, 2014). The second is the rejection of the politics of inevitable and of the "security discourse" (Karyotis and Rüdig, 2013). According to this rhetoric, an urgent threat is evoked by governments as a way to deflect blame attribution when harsh measures are to be implemented. These measures are presented as the only way to survive the existential threat. In the 2012 elections a big percentage of the electorate did not accept the government's rhetoric and was unsympathetic to the "lesser of two evils" argumentation.

The 2012 elections (May and June) led to the formation of a coalition government between PASOK, ND and Democratic Left, a small left party. During this period the second MoU is signed and more austerity measures are implemented.

Elections are called for the 25th of January, 2015, just weeks after the final empirical phase of the PhD. It was anticipated that SYRIZA would win the elections with a big margin with the mandate to put an end to the austerity and to cancel the MoU. As the party leader, and later Prime Minister was saying, SYRIZA would cancel out the MoU with one law. This had generated great expectations in many of the officials interviewed at that time who were undergoing an admittedly unfair evaluation, according to which certain quota (25%) of civil servants had to be evaluated as performing poorly, regardless of their actual performance, and thus be dismissed from work, in order to save on public spending.

The empirical phase ended before the elections. This is important to note, because the weeks before the elections was perhaps the time where the Greek citizens were most optimistic about the prospects for a positive change in the future, an optimism that seeped through the interviews as well.

What followed the elections of January 2015 were monthly negotiations between the Greek government and the international lenders over ending austerity, or modifying it, cutting the national debt, until in July 2015 the government brought the end result of the negotiations to the electorate. With a referendum, the first one to take place in Greece after the abolishment of the dictatorship, the electorate would decide whether or not the proposed measures would be accepted by the government or not. Although the proposed measures were rejected with a 62% majority, the government accepted the new austerity package.

This has been a catastrophic hit for Greek democracy and on the collective psyche. As Morales et al (2014) note "[*d]emocracy is generally associated with the capacity of citizens to control political choices, a control manifested in the theoretical responsibility of elected representatives toward those they represent and in their obligation to publicly justify the decisions they make*" (op.cit. p. 441). This capacity of citizens took a severely hit after the referendum. Teperoglou and Tsatsanis (2014) report on satisfaction with democracy and trust towards national and European political institutions. Already in 2011 satisfaction with democracy in Greece had fallen to "historically low levels" (op. cited p.6). Trust in national government, parties, the parliament and the European Union plummeted. Studies have yet to be conducted to document the effect of the overruling of the referendum (one of the most

direct means of democracy) on the trust towards the government or democracy but it is safe to assume that it will be at even lower levels at those recorded in 2011.

The last point, the trust of citizens on democracy (their capacity to control political choices) was one that emerged in the interviews often and we can see that democracy and trust to the political regime has been an important concern for the interviewees, even before the referendum.

### 4.3.2 The Interview Process

The list of potential interviewees was at first compiled based on the document review and further on enriched by an internet search on which agencies were responsible for water management in the Cyclades and who the biggest users are. It was later on enriched and further refined with each empirical phase. The most common and preferred way of establishing a contact with a potential interviewee was by phone, usually upon referral by another interviewee. Alternatively an e-mail was sent, but this was not very common.

It was observed that local actors were very keen on having their points of view heard and getting an appointment with them was usually very easy, and the interviews would last for at least an hour, with many interviews lasting over two hours. On the other hand, national actors based in Athens were somewhat reticent to disclose any information that went beyond what was available on-line on their agencies' website and interviews with them rarely exceeded thirty minutes.

All interviews were intended to be face-to-face, but one was made exclusively by e-mail, while three more where initially made face-to-face but then other questions emerged and were followed by e-mail interviews. One of those face-to-face interviews had to be interrupted due to prior engagements of the interviewee. One more e-mail interview was arranged but the interviewee never responded.

After having read the Project Information Sheet, the interviewee was asked to read and sign the Informed Consent Form, which without exception, everyone did. One national actor was sceptical about the transparency of the project and whether or not their anonymity would be ensured, but at the end they too signed the Informed Consent Form. After that, the interviewee would be asked whether or not they would consent to having the interview recorded, in order to help the researcher in the analysis. All but one interviewee in Athens accepted.

Upon completion of the interviews, the researcher's notes were noted down in the research journal. These included the time and place of the interview, conversation flow, reactions of the interviewee in a specific topic, information that stood out as extraordinary and that ought to be followed up by the researcher, as well as self-evaluation on the researcher.

In total 30 in-depth interviews were conducted (see Table 18), without counting the follow-up interviews via e-mail or phone.

Table 18: Interviews conducted by the author

| Seat | Authority | Interviews |
|---|---|---|
| **Athens** | Special Secretariat of Water | 3 |
| **Athens** | Ministry of Agriculture | 2 |
| **Syros** | Water Directorate of South Aegean | 5 |
| **Syros** | Prefecture of South Aegean | 4 |
| **Tinos** | Municipality | 5 |
| **Syros** | Municipal Water and Drainage Company | 2 |
| **Syros** | Agricultural Association | 2 |
| **Tinos** | Domestic Water Users | 3 |
| **Tinos** | Legal Experts | 2 |
| **Syros** | Touristic Users (owners) | 2 |
| **Total** | | **30** |

*Source:* Own compilation

## 4.4 Ethical Considerations

Researchers face ethical issues at every phase of their research. An important ethical consideration of concern during this study was ensuring the anonymity of the interviewees. This study clearly names the two selected islands, as the research design depends on the rich case description and the deep understanding of the local context. If one of the islands were not the administrative capital, it would have been possible to name the two Islands "Island A" and "Island B". Since this is not the case (there can be only one capital after all), the option of anonymising the role held by the interviewees was preferred.

Interestingly, with the exception of two officials in national agencies, none of the other interviewees explicitly expressed any desire to remain anonymous. In fact, some of them said they would have no problem if their names would appear on this dissertation or subsequent publications that would stem from it. However, as some of the information obtained in the

interviews was quite personal or could only be obtained by the specific interviewee, and in accordance with research ethics, all interviews were anonymised. This is easier said than done, since one of the particularities of these islands are, as mentioned in previous chapters, precisely their small societies, which means that officials are very easy to recognise based on their position. There is only one director of a specific agency as there is only one agricultural association. To avoid revealing the identity of the interviewees, their position will not be mentioned, where possible. Instead, terms such as “high-ranking official” or “member of the agricultural association” will be used, even though even this does not guarantee full anonymity.

## 4.5 Data Analysis

All interviews were transcribed using F4 software, and then analysed with the Atlas.ti software which can support the analysis of such large qualitative information in text format, such as transcriptions of interviews. The analysis was done by a) reading all the transcriptions once to get a general grasp and then b) re-reading them and assigning codes to segments of statements, c) identifying causal links between the (dys)function of the water sector and the behaviour of the officials and water users and finally) concluding on the reason for the dysfunction of the water sector.

# 5 Results

## 5.1 The Water Sector' Dysfunction According to the Actors.

"*What I know is that every official, every administration, interprets the legislation as they like*". (Interview 1)

Identifying who is responsible for what concerning water governance on Syros and Tinos has proved an elusive task, one that not even key officials were easily able to shed light on[12]. A law, for example, is commonly updated by numerous bylaws, such as common ministerial orders (CMO) published in the Government Gazette (FEK), or more often than not a new law is passed without having first rendered the previous one obsolete, leading to a confusing situation where multiple laws are in effect over the same issue, often negating each other. There is a Greek term for this phenomenon – *polynomothesia*[13] – which carries the meaning of multiple, complex and often contradictory legislation. It is then up to the officials who are called to implement these laws and regulations to understand the institutional context, translate it and then explain it to those concerned. Through this process, the officials articulate the will of the state and thus *become* its embodiment.

An elected regional official (Interview 1) made special mention about the process of acquiring an installation permit for a small-scale floating desalination unit for a very small island, which would relieve its current water stress during the summer months. The installation permit alone required the fulfilment of over 70 conditions, issued in 69 different Government Gazettes (FEK). This means that at least 69 different common ministerial orders were issued, regulating the installation of one small floating desalination unit of 150 cubic meters. Acquiring the installation permit took over two years and, at the time of the interview[14], the regional office had been waiting for months for an archaeologist to visit the island because, according to one of the FEKs, installation of the floating desalination unit can only proceed with the presence of an archaeologist.

A comparatively simplified illustration of how polynomothesia hinders the work of officials and, hence, prevents not only attempts to rectify the water sector but even prevents officials from understanding their own responsibilities is the process for issuing permits for

[12] For a comprehensive list of key actors and jurisdictions, refer to Table 8, p. 21
[13] Polynomothesia: *poly* = many + *nomothesia* = legislation.
[14] May 2014

water use, as required by CMO 145026/2014[15]. Through this common ministerial order (CMO), a National Registry of Water Abstraction Sites (NRWAS) was set up, requiring that all water abstraction activities are to be registered upon being granted a permit. According to the legislation, it is the responsibility of the Prefecture to issue fines in cases of breaches of law, such as illegal water abstraction. But when asked about it, many actors reported that this was not the case in practice as, according to a recent bylaw, the Devolved Administration of South Aegean now had that responsibility:

"*A few days ago, an official from the Prefecture came to my office and told me this jurisdiction is not ours any longer, it's the Devolved Administration's now because the law changed. So, we took all our rulings and sent them to the Devolved Administration. This is ridiculous, it causes serious problems*". (Interview 1)

The administrative reform of 2010 (Kallikratis) further exacerbated the confusion over jurisdictions, as newly formed administrative units were named after old ones but without having the same jurisdictions. An example is the authority known as "Prefecture". In the old administrative setup, Prefecture referred to what is now called an Administrative Region[16], a branch of the central government which retains many of the old administrative unit's jurisdictions. Following the Kallikratis, now Prefecture refers to a new form of administration, composed of elected officials.

As one official said, "*Prefecture here, Prefecture there. It is confusing even for us who are involved in it. We couldn't make sense of it at first. Imagine what this did to the citizen. I think this just finished off the citizens*". (Interview 2) It is worth mentioning that, even during the interviews with officials in the Special Secretariat of Water in Athens, officials were still referring to the now-obsolete old Prefecture and disregarding the elected Prefecture, established in 2010.

Another appointed official in Tinos put it thus: "*So at some point there is a mixing up of jurisdictions with Kallikratis that we still haven't figured out what and how things should be done. And it's a whole mess*". (Interview 3) She further noted that, following the reform, she now has "*a network of people in municipalities in the Cyclades that I call to exchange interpretations, ask how did you do it*", because the legislation is so confusing, and in her organisation there is no legal expert to clarify such issues for the officials. In this vein, an

[15] Published in the Government Gazette: ΦΕΚ 2878/Β/27102014

[16] In this thesis, I opted for the term Prefecture instead of Administrative Region, as it is the term readers most likely will be more familiar with.

issue that surfaced several times during the interviews in relation to interpretation of the legal framework is a lack of personnel qualified to do exactly that: interpret and translate complex and often contradictory working rules. Although it has been foreseen in the organisational plans for all authorities throughout the nation that they would have at least one legal expert, there is in fact no one employed in the whole of the Cyclades for this post (Interview 4). One official in Syros said about his dealings with the current legislation have made him "*paranoid*" (Interview 1).

Difficulty in deciphering the currently revised working rules is not the only grievance of local and regional officials. Their inability to influence policies gives them a "sense of helplessness" (Interviews 2 and 5), and it is easy to see that there is a clear top-down setup that allows little space for voices to be heard.

Yet, the officials in Athens don't seem to share the islanders' bafflement. From early on, it became apparent that the officials in the Special Secretariat for Water in Athens were not keen on sharing their experiences with me. Appointments were postponed and even cancelled on the spot. Unlike in the authorities on the islands, there was indeed a legal expert in the organisation, who was not persuaded of the validity of the questions I had posed and left within five minutes into the interview. The people I did talk to mentioned that there is no problem with coordination between the national (Athens) and local (island) levels. They specifically mentioned the Prefecture[17] as a "basic actor" in preparing the River Basin Management Plans for the Cyclades, as required by the imposition of the EU's Water Framework Directive. Specifically, the official said that "*we have a very close cooperation and communication on a daily basis. Not only in regards to the management plans but also on many issues*" (Interview 6).

At the time of my field visit, the central officials in Athens were overseeing preparation of the river basin management plans for the Cyclades, as required by the European Water Framework Directive (WFD). The management plans were to include a state-of-the-art overview of water resource status, pressures and challenges upon which management measures would be prescribed. Acquiring data for groundwater was assigned to a national agency which, according to some interviewees, had either incomplete or outdated data, the reason for which was that there was no data registry in that agency, as every official worked on their own field and was not obliged to share data with others. What is more, upon their retirement, officials would not hand over their data to younger colleagues. As one interviewee

[17] In fact, they meant the Devolved Administration and not the elected Prefecture.

put it, "*It's a misfortune in the sense that there are people who left that agency, retired colleagues, older, and they did not inform their juniors. Or there were not any juniors to start with, there was a gap. So the experience was not transferred from the old generation to the new"* (Interview 7). This reluctance and hesitance to share information was confirmed by various interviewees in different agencies.

To a large extent, the data used in the management plan are already secondary in the sense that they were not collected by the agency but rather taken from existing sources, rendering it outdated. Reasons for the lack of primary data collection are – according to some interviewees – that the agency is understaffed as well as the fact that the agency does not seem to cooperate closely with local officials who have a deeper and more detailed knowledge of local resources and conditions (Interviews 6,7 and 12). As one official in Athens commented, the management plan *"should have been done by authorities at the islands, but that was not a possibility so it was done centrally*" (Interview 6).

The central officials in Athens – the ones who at the end of the day will actually be designing the nation's policies – are disconnected from the reality of the islands. They use outdated secondary water data and, although they are in contact with local authorities, they communicate in a hierarchical manner, as suggestions from local authorities are not taken up by central ones.

Perhaps though, the problem does not lie in the administration in Athens or in the Cyclades. Perhaps the water sector is dysfunctional because water users are careless in their water consumption. It might be that locals working in the tourism sector are unaware of the challenges or that agricultural producers use water-intensive technologies and crops. To explore to what degree these statements were true, I interviewed domestic water users, hotel owners and farmers on both islands. What can be said without any doubt is that all of the individuals interviewed were well aware of the existing water scarcity and tried their best to make the best of the situation.

A hotel owner in Syros mentioned that her water consumption (and therefore also water bill) was very high because "*I can't expect people from Scandinavia, for example, to know about water scarcity here, and I can't be the water police and tell them don't do this and don't do that. People come here to relax.*" (Interview 8). What she did though, was to establish a common kitchen, where she does not allow her guests to do the dishes. She does them herself instead, because her way of doing them required very small amounts of water.

"*One does what one needs to do*" (Interview 8). What both hotel owners did, both on Syros and Tinos, was to install toilets with controlled flow and place a sticker in bathrooms requesting guests to save on water. They inform their guests that tap water is potable but it might taste strange and, therefore, they always keep complimentary bottled water in the rooms' fridge for their guests. At home, they were both much more conscious of their water use and they saved water wherever they could. When asked whether they thought things could improve in the near future, both were rather pessimistic. One hotel owner said:

"*They say things will get worse, with climate change. And it doesn't rain as much as it used to. And our politicians still work with the same mentality as decades ago. No, things will not get better*" (Interview 9).

Domestic users were much more critical than hotel owners. Trust –or the lack thereof – was a topic which often emerged in the interviews. On Tinos, they often talked about not trusting the municipal network because of the oxidised asbestos pipes. The municipality runs regular tests and quite often issues no-use warnings, a fact that further reinforces the belief of the domestic users that the municipal water is generally unsafe for consumption. Even though the aged network is slowly being replaced by new asbestos-free pipes, the mistrust remains, even within the municipality. "*I never give tap water to my children*", an official from Tinos said (Interview 3), and a colleague of hers who was listening to our discussion nodded his head. On Syros, some domestic users "use bottled water even to cook" (Interview 13) and there are even special delivery services that deliver boxes of bottled water to houses and pick up the empty bottles. Desalinated water "*tastes funny, unnatural. It's ok to cook in it, but not to drink it*" (Interview 13).

A high ranking official on Syros said that desalinated water is an "*acquired taste. It tastes funny at the beginning, but of course it's safe for people to drink. But this is where* we *come in. We should conduct campaigns telling people it's safe. I mean, they are paying for it anyway! The water is desalinated whether they consume it or not. Why waste it? Especially since it's safe*" (interview 4). We see here that desalinated water is in a way a lost opportunity, if people do not use it.

Agricultural producers cannot use desalinated water though. It is too expensive to use for irrigation. Instead, they drill wells and pump groundwater out of the aquifers. This comes at a cost, of course, since as groundwater levels get lower, farmers need to drill deeper to get water, which is itself of suboptimal quality because of seawater intruding in aquifers. As a

way to minimise costs and improve quality, some farmers on Syros collect rainwater during the winter and mix it with groundwater (Interview 9). The farmers' association in Syros has proposed that they re-use water from the wastewater treatment plant, which is now discharged in the sea upon treatment.

"*They literally throw water away! We are thirsty, in a matter of speech, and they are throwing water away! We went to them many times before the elections, telling them look, it's not that expensive to set a pipe network bringing water up north to us. We will produce more and of better quality. Syros will benefit from it! And nothing happens*". (Interview 9).

A farmer said that they were willing to go to seminars, to be organised by the regional authorities to train farmers in cultivating less water-intense varieties (like aloe vera) that would sell for a good price, but "we can't fund them ourselves, we need support, which we don't get".

An elected official in Syros corroborated the concern raised by the farmer about re-using treated water, saying that the reason it doesn't work is because of budget constraints.

## 5.2. The Remedial Power of Island Officials: How it is exercised

In the previous section, I offered an overview of how officials in Athens and on the islands as well as water users perceive the water sector and their role in it. Here I provide a more analytical account of the transactions occurring among officials and between officials and users.

### 5.2.1 Transactions Between Central Agencies and Island Agencies

According to views expressed in the interviews by officials from the two islands and in Athens, the only officials who believe that there is sufficient communication, interaction and cooperation between central and island authorities, are those in Athens, which speaks volumes about the quality of interaction and its direction. "*We have a very good and tight cooperation, of course. On a daily basis, for many and various topics, not only the management plans*", a central official said regarding the cooperation with island authorities. Yet, although a regional official in Syros corroborated the fact that they do talk frequently with colleagues in Athens, it was usually merely to clarify legislation and not to voice their own opinions or suggest new policy measures.

Elected island officials were disheartened by the "*dominant political culture in Greece*" (Interview 1 and 14). One of them went on to say that, at the "*governmental level, and I have*

*said this many times, there is an organised attempt to devalue local administration. So, our politicians, and when I say politicians I mean the legislators, constantly devalue local administration. And local administration is an important tool!*" (Interview 1). He continued by explaining that "*they believe that the more jurisdictions they keep to themselves in Athens and the fewer they give to decentralised local administration, the more they can control the citizens*".

But this disappointment is not limited to elected officials or to relatively low-level officials. High-ranking officials with whom several Ministries are supposed to have close and good relationships expressed their feelings of abandonment and helplessness, grounded mostly on the one-way communication style of the Athens officials and the belief that they are *"not being heard and taken seriously"* (quote from interview 2, corroborated by interviews 4, 7 and 14). One particular official said that on several occasions he had sent proposals to several ministries and agencies when, for example, the town building code was being reviewed or when policy proposals were made public for deliberation. "*We saw a window of opportunity there, you know? If we could get our proposal through then things would be improved*" (Interview 4), he explained. His proposal included making underground rainwater retention cisterns obligatory for all new construction on the islands, and his agency calculated that winter precipitation would be sufficient to meet most of the domestic needs of the permanent island population during summer, thus minimising pressures on groundwater and the need for expensive desalination plants. "*Other places with similar scarcity have it. In the USA, in Australia"*, he pointed out and then asking "*Why not us? Why pay so much money when the solution is here, in front of us*? *Some few people install such cisterns but it's on their own initiative and with no financial support, you know? And we can't rely on people's initiatives. And a few cisterns won't change the situation*".

His proposal was left unanswered on all occasions. We see here an attempt by island officials to engage in a *rationing transaction*, to provide a remedy upstream in the direction of the central administration. The official (along with colleagues from the agency) argued in favour of their proposal, but they could not convince the legally superior party to adopt it; they were not powerful enough to force the others within a presently existing legal situation.

The same official – who has many years of experience in water management on the islands – also offered insights about the way large infrastructure projects are planned, constructed and maintained. In accordance with the dominant hydraulic paradigm of the past decades, relatively large dams were constructed by the Athens-based Ministry of Agriculture (MoA) on

the majority of the Cycladic Islands. According to the relevant legislation, dams could be constructed by the MoA only for agricultural and not for domestic use[18]. What is interesting to note here is that there was a tacit agreement between all agencies and officials involved that the MoA would fund and construct dams, in theory to be used for agricultural use; in reality, however, the bulk volume of water collected in the dams has been fed into the municipal network for domestic use.

In sum, it would be difficult to say that all was well that amongst the MoA and the island officials. "*Personally I like the people there," said one island official, "they know what they are doing in their field. But their job is their own, you know? They just come up one day with a plan for a dam, and I say wait, why weren't we asked?".* (Interview 4) An experienced official[19] working for the MoA further corroborated this view, stating that essentially MoA only seeks to open up communication with local officials once the construction of a dam is ready to commence (Interview 15). Just like the officials in the other agencies based in Athens, this official too seemed very well informed on his field of expertise (dams and agricultural use of water in the Cyclades) and was capable of providing very rich, insightful and useful information on that field. Nevertheless, the information he was able to provide on other water-related topics – such as desalination and the municipal network, effect of the reforms – was not up-to-date and could understandably not be compared with the breadth and depth of knowledge that local officials have.

What we see here in the domain of transactions between MoA and island officials is a form of managerial transaction. Although the MoA and the island officials are not in the same hierarchy – they work in different agencies, and many island officials' hierarchical superiors are from the Ministry of Interior, not of Agriculture – there is still a clear dominance of the negotiational psychology of managerial transactions: that of command and obedience. The MoA commands that a dam will be built, and the island officials are expected to obey. Once again, the island officials find themselves in a position of no power to effectuate any change.

### 5.2.2 Transactions Amongst Island Agencies

Officials working in the islands do not comprise a single homogenous group. There are elected officials acting at the regional level and others at the municipal, but there are also

[18] A possible explanation for this was that at that time (from the 1970s to the early 1990s) the everyday economy of the islands was based on agricultural activities.

[19] This official refused to be recorded and I cannot therefore provide direct quotes, although I took notes during the interview.

appointed officials acting at the same two levels. And their visions and beliefs regarding how and by whom water management ought to be done in the Cyclades do not always match.

Perhaps the greatest tension can be found between the numerous agencies of the Prefecture and the Devolved Administration[20]. The interviews illustrate two main reasons nurturing this tension. The first can be traced to the re-distribution of jurisdictions following the administrative reform of 2010 – which gave more jurisdictions to the Prefecture – and the Law 3199 for water management, passed in 2013. The latter transferred many jurisdictions back to the Devolved Administration, a move that was not welcomed by officials in the Prefecture, who felt that their ability to influence water management was thus severely crippled. One interviewee from the Prefecture put it this way: "*We have so many jurisdictions; we are responsible for the good status of water resources for example. Fine. You tell me, how can I be responsible for the good status of water resources if I don't control who is using them?"* (Interview 5). This statement refers to the fact that the Devolved Administration was made responsible for issuing permits for water use, as per the 2013 law, a jurisdiction held until that time by the Prefecture. In the wake of the new law, continued the interviewee, "*[w]e have some decorative jurisdictions left, nothing of essence*. *It's like everything has to be controlled by the state. Because the Devolved [Administration] is the state here"* (Interview 5).

The second reason for the tension between the two agencies can be attributed to the different approaches taken by their high-ranking officials, who, although they were educated in the same field (geology), are diametrically opposite in terms of their beliefs regarding how water management ought to be done on the islands. One believes that drilling wells is still feasible for the Cyclades, as long as it is strictly monitored and the public retains the right to cease operation when deemed necessary. "*Not everywhere is salinized, not everywhere has sea-water intruding the aquifer. Some parts still have good quality water*", he remarked (Interview 4). Meanwhile, the other official believes that "*we have already overstepped our limits; we should not permit any more drilling. The [toxicity??] values for half of the drilling operations are over the safety limits*" (Interview 15). The dissidence between the two is so profound that, as one island official lamented, "*[it]makes things much more difficult than they should be. We have good personal relationships with them, but it's difficult to make them see our point of view*" (Interview 1).

[20] I remind the reader that the Prefecture is the elected regional government and the Devolved Administration is a part of the Ministry of Interior.

One of the jurisdictions held by the Prefecture is the possibility to regulate, that is to propose, Regulatory Decisions (RD) to be incorporated in the national Water Management Plans, which embedded within the Water Framework Directive. Through Regulatory Decisions, the Prefecture can impose restrictions on water abstraction and use, as well as any other domain that lies within its scope of discretion. Two major issues surfaced here during the research period. First, these management plans had not yet been finalised at the time of the interviews and, therefore, no Regulatory Decision was able to take effect. Second, the Prefecture was not engaged in the drafting of the management plans and, hence, "*only the views of the Devolved Administration will be reflected*" (Interview 15) in the result. What is more, none of the RDs proposed got the necessary permissions from the Devolved Administration, a fact that seemed to further exacerbate and intensify the tension between the two sets of agencies.

We can see from the foregoing that, in the last few years, meaningful jurisdictions capable of influencing water management on the islands were taken away from the Prefecture, which was then left with essentially no regulatory control over its water resources. Reflecting on what this could mean in terms of transactions, I argue the following. One can observe a trend towards transferring jurisdictions from the elected Prefecture to the Devolved Administration, which is consequently being given more rights and more powers, even if this is not accompanied by increases in staff. The more rights the DA is given, the more duties the Prefecture has. Although it would be possible to imagine that they could engage in bargaining transactions, each trying to persuade the other to adopt their stance, in reality we can clearly observe here the key characteristic of managerial transactions emerging: command and obedience.

The Prefecture, much like the Devolved Administration (DA) does with the central administration, has been trying through Regulatory Decisions to provide upstream remedies by attempting to engage in rationing transactions in order to influence water management on the islands. These attempts have been unsuccessful, because they are blocked by the Devolved Administration exercising its power as legal superior. In a way, the psychology of managerial transactions (command and obedience) is employed here as well. This is not to say that there is a personal vendetta between the two agencies and that the Devolved Administration deliberately blocks the Prefecture's RDs. Rather, it appears to be more the case that the DA is making use of its advantageous legal positioning in relation to the

Prefecture to advance its interests and to pursue water management on the islands as its key officials see fit.

On Tinos, relationships between local officials and the Devolved Administration were characterised by one interviewee, after a few seconds' pause, as "*tight but complicated*" (Interview 3). They are very frequently in touch because "*they give the final approvals. They are the long arm of the ministry, although they are called 'devolved'. They are a state agency*" (Interview 3). According to the local officials, the laws and regulations are not always clear to them, and they consequently need the input of the Devolved Administration officials, who "*are also struggling to understand things. Things change every day, and no one can keep track*".

On the other hand, one newly elected official in Tinos characterised the local officials' relationship with both the Devolved Administration and the Prefecture as being "very good and long lasting. We have very good cooperation" (Interview 19), adding that he was very pleased with how his municipality's input and ideas were received by both agencies.

Within Tinos there are not many officials working on water management, which in itself was an issue of concern for all the interviewees, who found it extremely challenging to cope with their agencies being understaffed. There was for instance no legal expert and, thus, the officials were left to either interpret the laws themselves or discussed them with officials at the Devolved Administration. Furthermore, there were not enough technicians to repair the network and no agronomists or geologists. Since there is also no municipal water company, unlike in Syros, water management goes directly through the (politically influenced) hands of the municipality of Tinos.

What becomes clear in the case of Tinos is that it is an island peripheral to Syros, and its local agency does not have the political stealth of its counterpart in Syros. Those on Tinos were truly at the receiving end of policies, with virtually no possibility to influence them. What they could do was apply for European funds to install and operate desalination plants, since national funds had been obliterated as a result of the financial crisis in Greece and the Memoranda of Understanding that brought about a harsh austerity program.

Although Syros lies on the periphery of Athens, Tinos is, in turn, peripheral to Syros, which is the administrative capital of the island complex. As such, the transactions in which officials from Tinos engage are mostly bargaining ones with other agencies within the island complex and in Athens, which mainly consist of pleading for information and guidance.

### 5.2.3 Transactions Between Island Agencies and Citizens

What any policy aims to achieve is to influence the behaviour of individuals so as to bring about a desired effect. What is particular in the cases of Syros and Tinos is that the policies at hand are not always clear – neither to the officials called upon to implement them nor to the citizens who must adhere to them.

While examining the transactions occurring between island officials and citizens, the following issues became apparent to me. First, the officials truly feel they have an obligation to serve the citizens. They do not position themselves on the opposite side; they do not believe there is a divide between "us and them", officials and citizens. This is something that is in line with one of the main assumptions of this study: the officials living and working in a small society function under overlapping roles, and the boundaries between their roles become blurry, which is not necessarily a negative outcome. According to the interviews conducted with officials in the islands, they feel liable to and not detached from the citizens, as they share the same problems with them. Essentially, although the officials are seen as the embodying the state, they also see themselves as fellow citizens.

Although this does not divert the officials from their duties, it does make them more understanding and more open to suggestions. One example of this likemindedness, echoing the "island mentality", can be seen in the proposal submitted by the Agricultural Association of Syros to transfer water from the wastewater treatment plant and re-use it for irrigation purposes. The proposal was submitted for permits to the Prefecture (before the jurisdictions were transferred to the Devolved Administration), which took a positive position; to the Municipal Water and Drainage Company of Syros (responsible for the wastewater treatment plant), which also saw it in a positive light; and to the newly elected Mayor of Ermoupolis[21], who promised that he would help secure the necessary funds. In this proposal, the farmers of Syros argued that using treated water for irrigation makes sense, not only for the farmers themselves, who would save on drilling and pumping costs, but also for the local economy, since they would not be discharging already paid-for water into the sea but would re-use it to produce agricultural products that would be then sold to the local market. An important positive side-effect would be that, because farmers would no longer need to drill for water, an important pressure on local water resources would cease, allowing the groundwater to recover. This point was enthusiastically underlined by one farmer: "*I told Mr. […] at the*

[21] The last empirical stage of the study took place three months after the municipal elections and unfortunately it was very difficult getting an appointment with the newly-elected Mayor of Syros.

*Prefecture that, if this comes through, all the farmers in Syros would surrender their drill-keys to him. We wouldn't need them. We would have water of a superior quality. And as much of it as we want*!" (Interview 9).

So, here we have an initiative taken by a group of individuals that, if implemented, would be very likely to have a profound effect on the water cycle on Syros as well as on the local economy. Most of the local officials responded well to it, even if they were caught up in the jurisdictional confusion. And the farmers I talked to were quite positive that the new local government would "*press on with this issue and we will have the water we need*", because they had developed a good working relationship with the new mayor, who is "*young and active and he used to have an office for helping people acquire funds for projects. So he is our guy"* (Interview 9).

If this proposal does go through, it will be a positive sign. It will not, however, be considered the norm, as many other users have reported that they do not trust the central government and do not believe that elected officials have the citizens' best interests at heart. As one resident explains, "*Here, the only way to become a mayor is to be the son of the mayor. This is how things are done. At some point, we have to accept that our generation has been incapable of addressing things that matter*" (Interview 10). But others do not put the blame only on the elected officials: "*Our society is indifferent, they only care about economic criteria. Tourism and the money it brings with it have altered people*" (Interview 8). Another resident said that citizens expect officials to deliver, without however engaging in a dialogue with the latter: "*Some people don't feel they are responsible for anything. They say 'look I elected someone, now it's their problem. They should fix it'. This is not really the way forward, is it*?" (Interview 8).

An initiative was taken by a group of grass-roots activists on Tinos who track streams, identifies spots where water has the tendency to flow slowly and create "slow streams", slowing down water speed and allowing it to filtrate into the soil and reach the groundwater, which increases thereby the water volume in the aquifer. According to one interviewee, they do this voluntarily and without the support of the municipality, which is "*too busy building desalination plants*" (Interview 20). It is worth mentioning, however, that even those users who expressed their dissatisfaction with how things are run by the public administration with regard to water management have acknowledged that huge steps have been made forward. The municipal network in Tinos containing asbestos is being replaced, and water cuts are becoming less frequent, due to the operation of the desalination plants. Large dams are not

being constructed anymore, and the small reservoir constructed on the outskirts of the island capital has become a local attraction and a habitat for wildlife, while providing water to the capital during the summer months. They even acknowledge the fact that appointed officials are overworked and underpaid and that they cannot do much more than what they already do.

So it seems that not all is bleak in the relationship between users and island officials, at least from the officials' point of view. What became clear in the interviews is that especially the appointed officials want to provide good service and proper, helpful consultation to citizens. What was interesting was that the majority of the officials referred to island residents as "citizens" and not "people" or "individuals". This might seem trivial but, as Wittgenstein taught us, words are concepts and they matter. So, when officials refer to citizens, this implies that citizens have rights and that the officials have a duty to provide services to those citizens. An indicative quote here comes from a high-ranking official from Syros: "*Public officials are exhausted, because they struggle to keep track of legislation, help the citizen as much as they can, and in a way to save the citizen*" (interview 2). He continued by saying that, "*[a]t the local level you simply have to – even if you don't want to, even if you are grumpy – come in contact with people that you know. So I believe that serving the citizen is at a much better level here on the islands*" than on the mainland.

What "serving the citizen" means differs from official to official. It might mean providing information about relevant laws online or explaining such laws when citizens call or visit their agencies. It always means providing water to the citizens, even if they don't drink it, as with the case of desalinated water. It might mean issuing water use permits, or not. In the words of one experienced official, "*I consider my biggest personal success to be not the projects I initiated, or helped realise, thought of and started. Not the projects that happened. No. My biggest personal contribution was the projects I did not allow to happen! We saved the Cyclades and its citizens, because we blocked some projects*" (Interview 7). This official then went on by explaining which projects were blocked, and who they were initiated by – all by ministries in Athens. We see here, then, that this official was able to make use of his power to force a national ministry to stop a project.

As we can also see, another official expressed deep ethical concerns when called upon to implement some laws: "*I see citizens coming here worrying that if, they don't register their wells, they will pay fines. They are old, troubled, tired. You can see they don't have much money. How can I tell them not to do it? How can I tell them that, if they do register the wells, in a few years a new law might come and say 'Ok, now everyone with a well should pay*

*something, because water is scarce'? I can't*" do either. And, she continued, "*I feel I am an accomplice to something I disagree with"* (meaning overseeing the well registration). *"But if I don't do it, maybe someone else will, and much faster than I do. Which is worse?"* (Interview 2).

The elected officials were generally concerned with the low level of trust that citizens have toward them but said they "*were trying to make citizens see that we are doing our best*" (Interview 1) and "*[are] of the opinion that citizens should choose wisely who to elect. They should choose someone with a vision, not a connection to the right people, and then complain about that politician*" (Interview 3). Further, "*it takes a long time for a culture to change. But things are changing*" (Interview 19). Towards achieving that end, though, elected officials did not seem to engage much with citizens. Rather, they delegated that task to the appointed officials, and they also planned management strategies, but mostly they were busy applying for European funding schemes to finance either new desalination plants or replacement of old network pipes. They did, however, see a need to change citizens' perceptions about public administration, especially local administration, and provide citizen-friendly services as much as they could. Yet, given the citizens' mistrust towards the central government, they were not terribly optimistic about the future because, as we have seen, water management remains overwhelmingly in the central government's domain.

## 5.3 Users: Relations with Authorities and Beliefs.

As with local officials, one cannot speak of water users on the study islands as one homogenous group either. Users include large and small hotel owners and their clients, domestic users in the capitals of the two islands as well as in their numerous villages, and various-sized businesses and industrial units. Professional and part-time farmers are also water users. In the end, all of the officials are also water users as well, as entailed by the multiple roles assumed by officials and the overlapping social relationships occurring within small islands and small societies.

The *agricultural users* interviewed on Syros were highly motivated and engaged in dialogue with regional and local officials. They understood local infrastructures and local water conditions very well and, based on that deep understanding, proposed water management measures to save and re-use water. Because of their good relationship with local and regional authorities, the Syros farmers were the most optimistic group of users interviewed. Their action was informed by the belief that re-using treated water for irrigation

would achieve a win–win situation, with everyone benefiting – primarily the farmers themselves, as they would be able to produce products of better quality in greater quantity, which they could then sell at higher prices at the market. Saving water is key to their plan to be financially better off by increasing their production and income.

*Hotel owners* interviewed were not as dependent on the quality of water used as the farmers were but, rather, more on the quantity. Due to the municipal strategy of increasing production of desalinated water and safeguarding water provision during summer months, hotels have not experienced water cuts in recent years, but their owners did raise concerns about the cost of water, which in turns raised their own operation costs. Because of this, they took their own initiative and installed basic water-saving technology (controlled-flow toilets) in hotel rooms and put up stickers asking customers to save on water. But, unlike the farmers of Syros, they did not reach out to local and regional authorities, because "*what can you expect from the government? All they want is our money, the taxes. And they give nothing in return*" (Interview 8). The hotel owners interviewed did not turn to local officials for support and did not look for subsidies, because they believed that the state – and in their mind the island officials *are* the state – will not support them. They felt disheartened. They took their own initiatives because they believe that saving on water costs will minimize their operational costs and, thus, improve their financial situation, because they did not trust the state to support them. In effect, saving on water was, it seems, a means to achieve as much independence from the state as possible.

*Domestic users* from both islands tend to avoid using tap water. On Tinos, it is because they do not trust that the water is safe for consumption, even though the municipality runs regulars tests and has been replacing old network pipes. It is indicative, though, that even an official I interviewed from Tinos said "*I would never give tap water to my children*" (Interview 3). All domestic users interviewed reported dissatisfaction with the taste of the water, adding it as another reason they do not drink it. The consequent cost from buying bottled water was indeed a concern, but giving up on bottled water was not seen as an option, since they believed that avoiding tap water was a safety precaution for ensuring that they would not fall ill because of asbestos contamination or from other substances flowing in the water through the aged network. This follows from the mistrust residential users have towards the capacity of their local administration to act quickly, to locate and repair a damaged pipe early on, or run safety tests on an adequately regular basis.

Likewise, on Syros domestic users do not like the taste either and, thus, substitute tap water with bottled water or even buy their own "domestic desalination units" that filter tap water, once more to eliminate the taste. Although the network in Syros had been replaced recently and meets all current safety standards, and its desalinated water is filtered several times, users associate the particular taste of desalinated water with something unhealthy. A resident of Tinos offered this opinion: "*They* say *it's ok to drink, that's what* they say. *I don't know. I don't like the taste of it. It's ok to cook in it, you know you kill anything inside it this way. But I don't drink it*" (interview 20). Thus, it appears that residential users on Syros prefer bottled water because they do not trust the taste – and therefore the safety – of their tap water, because they do not trust the word of the officials who say "it's ok".

What one can observe here is that hotel owners and domestic users do not consume tap water not because it actually is unsafe, but because they perceive it as such, owning to their lack of trust towards the officials' assurances regarding the water's safety. Public officials have failed to bring about a change in the users' behaviour regarding drinking tap water. This is what Bromley and Hiedanpää (2014) coined *inducing transaction*, the durable breaking of old habits and taking of new ones, through durable changes in the environment in which the behaviour takes place. This would mean that in the case of water users, who don't believe in the ability of the island officials to run regular controls and take the measures necessary to ensure that water becomes and remains safe for consumption, and who moreover feel they cannot rely on the state to improve things, there is a clear scope for intervention and improvement. If the social and political environment in which the habit takes place is found wanting by the users, if the officials in particular (and consequently the state) are seen as inadequate, then this also where attempts to rectify the water sector should focus on.

## 5.4 Beliefs and Desires Motivating Remedial Power

So far, we have seen how the remedial power of officials is put into action and, in the previous subsections of this chapter, the role of the smallness of these islands has been hinted at. Recall that, according to Bromley (Figure 10, p. 54), an action is set in motion by beliefs that are, in turn, informed by the desired outcome one wants to achieve in the future. So, when we look at the way officials exercise their remedial power (action), we should also look at what drives that action. What are the beliefs of the officials? What are the desired future outcomes they thus hope to achieve?

In what follows, I seek to shed light on what beliefs and desires motivate the actions (the remedial powers) of the local study-area officials. I have discussed earlier (in chapter 3) the central role remedial powers hold in understanding how and why water management is done in a specific manner on these islands and what implications it has on the relationships between officials and users. In small societies, such as the small islands I am concerned with in this study, officials not only set the will of the state in motion but they also *become* embodiments of the state. Their will is the will of the state; their visions are those of the state, as are their actions. Exercising their remedial powers not only sets the machinery of the state in motion and, thus, exerts influence on island water resources and their management but, as they transact with citizens, it also influences the ways the state is perceived by them. Remedial power lies at the heart of the transactions occurring between citizens and officials. Consequently, understanding the beliefs and desires motivating the behaviour of officials working on water management can hopefully provide relevant insights on possible ways to improve the water sector.

What became clear during the interviews is that all officials actually do seem to care about ensuring uninterrupted and safe water provision to the citizens. What differs, however, are their approaches regarding how and why this is best achieved. One could speak of two broad categories of the ways officials prefer, informed by their corresponding beliefs (Figure 11). The first category of officials does not perceive what they do as a job but, rather, as a service to the public, a *leitoúrgima*[22]. These include both elected and appointed officials, believing that it is their duty to provide good service to the fellow citizens. As one official put it: "*In our job, you can't say today I don't feel like working, right? The citizens are expecting things from you. They wait for information, for guidance. They are lost with all this mess. They are asking 'How I do this? What do I have to do?' And we need to come up with the answers, no*?" (Interview 2). Another official said something similar:

"*And they [the citizens] are calling me and asking me 'Mr. X, what kind of paperwork do I need for the permit?' Ten different people are calling me ten times a day. The answer can change during the day, because this is how fast the laws change! And I am in the middle of it, trying to give the best answer I can. It's not their fault*[23]" (Interview 5).

[22] In Greece, some jobs are seen as being more than a job, because of the services one provides to others through them. These have traditionally included, for example, being a teacher, a priest, a doctor. They are called *leitoúrgima* (having vocation, function, service, responsibility). Many of the interviewed officials referred to what they are doing as being a *leitoúrgima*.

[23] During that 1.5 hour interview, two people called asking exactly that question.

These are the officials who work overtime and are on the phone with officials in Athens and in other agencies in the Cyclades to ask about specifications for laws, for possible exemptions from them. This is something that has not been mentioned thus far, but it is important for understanding these officials. In a country where circumventing the law to one's benefit is a coping strategy and the norm, and where public officials are perceived as lazy and self-serving, it is remarkable that not one of those interviewed mentioned or hinted that *island* appointed officials are corrupt. What is more, it is worth mentioning that some officials did consider circumventing the law – not so that they might gain but, rather, so that citizens could "*spared of all this*" (Interview 2, corroborated by 3, 5, 14, 18). No interviewees among the officials reported that they did in fact act upon their belief that something postulated in a law was unfair or uncalled for, but they did report having ethical concerns. One official, as already cited above, said "*I feel I am an accomplice to something I disagree with. But if I don't do it, maybe someone else will, and much faster than I do. Which is worse?*".

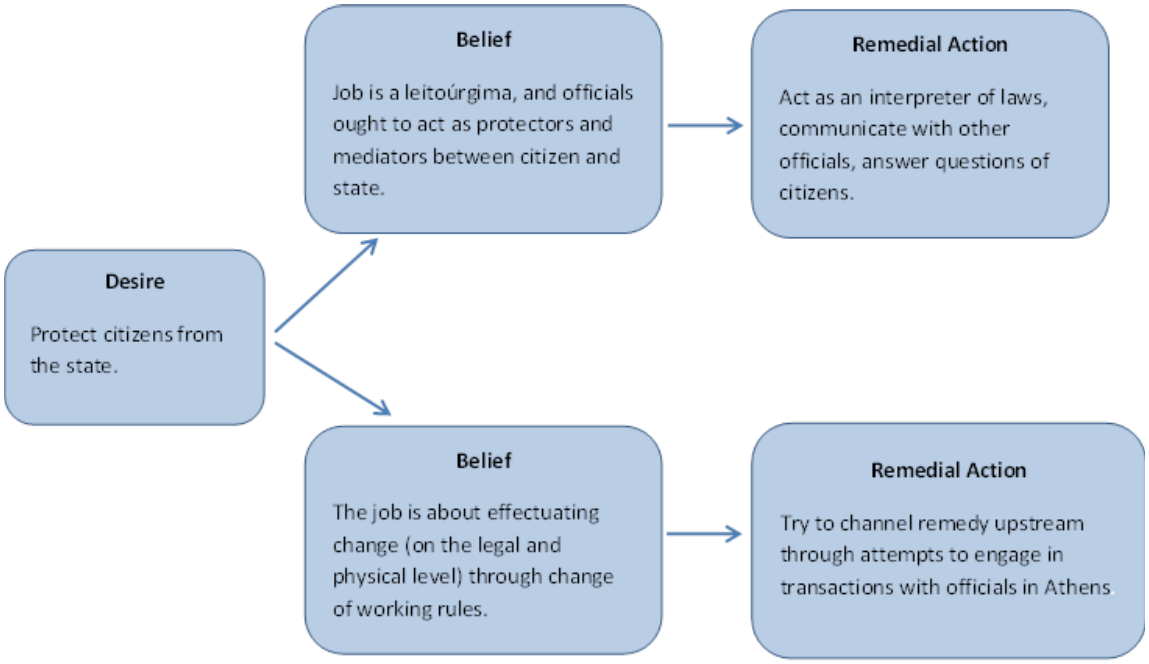


Figure 13: The desires, beliefs and remedial actions of the two identified categories of island officials
*Source:* Own compilation

What motivates these officials is the belief that the citizens need saving from a state which does not understand or care for them, viewing them only as sources of taxes and as constantly trying to cheat it. By contrast, these local officials position themselves on the citizen's side, perceiving themselves as being powerful enough to guide citizens and act as a buffer but not powerful enough (of not in the legal position) to effectively change the state.

The second category of officials mostly consists of elected officials but also includes experienced high-ranking appointed ones as well. Like the officials of the first category, they also believe that it is up to them to protect local citizens from an interventionist state that does not take them seriously into consideration. What differs here is the entry point for their intervention, as these officials believe that it is not enough to simply offer legal guidance to citizens; one should, rather, try to change the working rules to start with. Such officials do so by becoming engaged as much as they can with agencies in Athens, taking the initiative to propose changes in existing laws or proposing new ones. They take advantage of their position to effectuate as much change as they can within their scope of discretion, while also acknowledging that this is limited. These officials not only strive to set the machinery of state in motion but also to alter it, because they believe it to be ineffective and unfair. To this end, they attempt to channel their remedy upstream, to Athens, as it is there, the officials know well, that decisions on the water sector in the Cyclades are being made, not on the islands themselves.

## 5.5 Reflecting on the Nature-Related Transactions

Reflecting on the physical view of transactions brought forward by Hagedorn (2015, 2008), we can observe the following. The physical transactions (in our case for example the collection of actions leading to the overabstraction of groundwater and the operation of desalination plants) activate the action situation. There are multiple actors transacting simultaneously, each attempting to influence choices available to themselves and to others, ultimately aiming at changing the institutional setup governing the water sector, each with different ability and power to do so.

These transactions are characterized by low modularity and high functional interdependence of process. Low modularity means that the actors (and transactions) cannot effectuate change without interaction with others. They also operate within a high-functional interdependent system, meaning that changes in one part of the system (the water sector) significantly affect other parts of it. The combination of these two characteristics leads to *complex-interconnected transactions* (Hagedorn, 2015). We can apply this syllogism in the proposal brought forward by the Agricultural Association of Syros for the re-use of treated wastewater to irrigate their agricultural production. This proposed transaction is highly modularised, as it needs the interaction with other actors in order to be effective. The local authorities have to agree with the proposal and find the funds necessary to construct the pipeline transferring the water to the farmers. It is also highly-functional interdependent, as in

case it's implemented, this transaction would have fundamental effects in the water cycle of Syros and consequently in its water sector, by eliminating groundwater abstraction for agricultural uses, allowing the aquifer to replenish.

The same is true for the proposal of island officials to make the construction of sub-terrain cisterns obligatory for all new constructions. It would meliorate the pressure on local aquifers and would offer a new source of water for local inhabitants. For it to be successful though it would need to transact with many other parts of the system (officials in Athens and in the islands, as well as actors currently not in the action arena, such as construction companies). Officials operating within the central administration, in Athens, also engage in *complex-interconnected transactions.* Although they lie outside the physical boundaries of the island water system, they have the political and legal power to directly influence it, by defining the choices available to local actors and water users. They are the most powerful and influential actors in the water sector whose actions have direct and lasting effects.

## 5.6 Telling the Story Anew

In the previous chapter, we considered how central and island officials as well as users interpret the institutional setup pertaining to water management and how they perceive their roles in it and reflected on the physical view of transactions. We further looked at transactions across agencies located in Athens and on the islands. In this chapter, I want to summarise the kinds of transactions taking place in the study area and briefly mention some of the main conclusions and implications deriving therefrom.

### 5.6.1 Summarising Transactions

Summarising the transactions occurring at various levels within the water-sector domain of Syros and Tinos, we can distinguish the following categories:

a) *Managerial transactions* between:

- The Water Directorate officials and individual water users.

This includes officials at the Water Directorate and individuals who break the law by, for example, drilling illegal wells. After someone has filed a complaint[24], the officials at the Water Directorate will examine such wells and, if deemed illegal, a fine will be issued. Inspectors of the Prefecture of South Aegean can also issue fines, but only for environmental violations.

[24] Municipalities are responsible for monitoring and controlling illegal activities, but they are understaffed and rely exclusively on complaints filed with the municipality by citizens.

- Officials at different administrative levels.

Managerial transactions among legally superior and legally inferior officials occur when, for example, central officials in Athens request a water abstraction registry to be created by the island officials and made available to them by a specific deadline. Likewise, the Water Directorate can request files and information obtained by the Prefecture. Officials resort to applying elements of the negotiational psychology of managerial transactions when they want to impose their own will on the wills of hierarchically inferior officials, especially whenever they believe that their counterpart in the transaction has erred in terms of the way they approach water management for the islands.

Various administrative levels co-exist on the islands, and one can observe bargaining transaction taking place between them as well. One typical example is the issuing of Regulatory Acts by the Prefecture of South Aegean, through which the elected regional authority can influence water management in the Cyclades (i.e., by forbidding groundwater abstraction in specific locations, or months, or below a specific depth). These Regulatory Acts are to be approved by the Devolved Administration, but, none of the Acts proposed by the Prefecture around the time of the interviews had received such approval.

b) *Bargaining transactions* are quite common and numerous, taking place between:

- Island and central officials.

Island officials from both islands and at different administrative levels (elected or appointed, regional or local) frequently call officials in Athens, pleading for clarification of unclear or conflicting legal documents or for extension of deadlines for the submission of documents needed for acquiring water-abstraction permits.

Another bargaining transaction worth mentioning is the proposal submitted to various agencies by the Agricultural Association of Syros for the re-use of water treated in the wastewater treatment plant so it can be used by the farmers for irrigation purposes.

- Water users and island officials

Water users often call island officials, pleading for an extension of the deadline for submitting documents, and the officials then transfer the request to central officials to Athens. At the time of the interviews, numerous extensions had already been granted. Island officials are often asked by users to provide specifications regarding various legal requirements or for information on where to seek professional assistance in order to meet those requirements. For example, a bylaw was passed that required indication of the geographic coordinates of water

abstraction points, but many users were not technologically literate enough to do so themselves. So officials at the Prefecture advised them to visit a technical study office that could provide the required service for a low price (Interview 18).

c) Although originally conceptualised for parliamentary activity, we can identify some form of *rationing transactions* taking place on the islands, mainly directed upstream.

In a sense, such transactions pertain to "negotiations of reaching an agreement among several participants who have authority to apportion the benefits and burdens to members of a joint enterprise" (Commons, 1934, p. 68). Thus, a claim can be made that when island officials interpret the legal documents sent to them by central officials in Athens, and when they enter into negotiations with them regarding how to interpret and implement the laws written therein, they are then engaging in rationing transactions, in the sense that they "apportion […] benefits and burdens to members of a joint enterprise" (ibid).

In a way, officials from the islands attempt to constantly engage in negotiations with central officials, either through asking for specifications of legislation – implicitly inquiring about the leeway available to them – or through proposing changes in the institutional setup, such as by making underground collection cisterns obligatory on the islands. In engaging in such transactions, island officials appear to be trying to expand their scope of discretion, or at least stretch its effectiveness. Identifying numerous and continuous attempts at rationing transactions originating from the island officials seems an evident indication of their wish to have a voice in island water management.

d) It is worth mentioning that *inducing transactions*, were not identified here.

Inducing transactions, aiming to "bring about specific behavioral changes when the individual agent has no interest in altering those existing behaviors" (Bromley and Hiedanpää, 2014, p.10), pertain to habit breaking or changing and require (at least) one authoritative agent guiding the habit-breaking process. Such a process was not observed in the selected islands, even though many interviewees seem to believe that, if the water sector on their islands is to be improved, then current ways (or habits) of doings things have to be challenged, and new habits must be shaped. This would, however, appear to be particularly relevant for all actors involved: from water users avoiding tap water, to hotel owners not installing water-saving technologies extensively in their units, to part-time farmers illegally drilling wells and so on. Inducing transactions –habit breaking and habit taking, is something identified as instrumental for the rectification of the dysfunctioning water sector by nearly all

actors involved. It is something whose lack was also commented and partly lamented widely by interviewees. It is here that scope for intervention is identified.

### 5.6.2 Implications

Island officials feel they have a duty to serve the citizens of the islands, providing them with water of good quality, in sufficient quantity and at a reasonable price. At the beginning of this study, I laid focus on the water sector as a whole, and no particular actor was considered to be more important than any other. As my examination of the water sector progressed, it became clear that two dimensions in the water sector were of undeniable importance: a) the *island officials* exercising their remedial power and, thus, setting the machinery of the state in motion and b) the *islandness* within which the officials are embedded and by which they are strongly defined.

Residing and working on an island influences the way such officials work, for a number of reasons. For one, there is the overlapping social relationships in which they daily engage, meaning that the citizen is not only the recipient of their actions but also a neighbour or a friend. Another reason is that, due to the discontinuity of space, the finite nature of land and other resources on an island become much more tangible than for those living on the mainland. Insularity also means that identifying water sources and knowing their current state is a relatively easy task. Finally, island officials cannot spare themselves from any manifestation of the water-sector dysfunction, as they too will experience water cuts, they too will pay higher than necessary water bills. Islands officials then become both representatives of the state and citizens at the same time. It is precisely this dual identity of theirs that equips them with the necessary knowledge and desire to rectify the water sector. Unfortunately, they do not have a legal stance allowing them to act upon their beliefs.

# 6 Conclusions: Why the Water Sector in Cyclades is Dysfunctional

This study set out to diagnose the water sector in the Cyclades, identify its dysfunctionality, analyse the reasons for it and prescribe ways to rectify it. In the previous chapters, I have identified the dysfunction (disrupted, costly and insecure water provision, Chapter 2), explored conceptual tools with which to diagnose it (Chapter 3) elaborated on the abductive research design and methods applied (Chapter 4) and analysed the transactions occurring within the Cycladic water sector (Chapter 5). In this chapter, I provide an answer to the key question guiding this study: Why is the water sector in the Cyclades dysfunctional? I will do so by continuing to work through the abductive syllogism developed in the foregoing chapters and, thus, conclude by developing a theoretical explanation for the continued dysfunctioning of the water sector in the Cyclades, despite decades-long efforts to rectify it.

My interview analysis has revealed that all officials involved, particularly those at the island level, appear to be committed to providing uninterrupted, safe and as reasonably priced water as possible to the users on the islands. They tend to work long hours trying to fulfil their tasks to the best of their abilities, giving rise to a further question: if everyone is so committed, why isn't the water sector functioning in a better way?

Several key concepts were used to guide the quest for a theory that would explain the dysfunction. I have problematised the notion of islands and the effects size, their geographical setup (discontinuity of space) and consequent distance from decision-making centres have on island administrations. As confirmed by the interviews conducted with island officials, island administrations operate in a different manner than their mainland counterparts, owing to the overlapping social relations within which such officials are embedded, coupled with their familiarity with the local situation. Regardless of their positions, whether they are elected or appointed, in a national, regional or local agency, island officials seem to position themselves as the islanders' allies, a view that has implications for the ways in which they exercise their remedial powers.

I have turned to institutional economics to provide a unit of analysis suitable for this study and identified transactions as the best-suited unit. Here, using the tenets spelled out in Hagedorn's IOS, according to which the physical transaction is the trigger activating the action situation, I used transaction as the unit of analysis. Transactions have been understood, as per Commons, as the point where human wills meet, negotiate and, finally, lay down a rule for action. To further unravel how these transactions occur and how they come about, we explored human behaviour and concluded that human action is motivated by the belief that a

certain action will achieve a desired outcome in the future. Thus, human actions – and by extension also transactions – are motivated by beliefs and desires.

This has implications for the remedial powers of the island officials, whose beliefs and desires are strongly influenced by their habits derived from living on islands. Remedial power is "the activity of officials setting the machinery of government in motion, and getting one set of officials responsible for enforcing what they define to be the rights in the case. If the officials are corrupt, negligent, incompetent, biased, or revolutionists, the legal right is nevertheless exactly the equivalent of what they do or may be expected to do" (Commons, 1924, p. 110-111). The officials' habituation to the characteristics common to living on islands leads them to undertake many roles, not least the role of the protector of the island (with its people and its water) from the rule of laws originating from the distant decision-making centres in Athens. How exactly do island officials exercise their remedial power? What do they believe when they act in a certain manner? How is this influenced by their relationships with central officials in Athens and to island citizens? What is the trigger motivating the officials to act?

Combining insights from nissology, administrative studies and institutional economics, I have formulated a basic analytical framework for guiding my investigation in relation to: a) institutional structure, b) the ways in which officials exercise their remedial powers in small societies, meaning how operating within a small island society influences the exercise of officials' remedial powers and c) the reasons why individuals involved in the water sector act the way they do.

Having conducted and analysed over thirty interviews with officials in Athens and on the islands as well as with water users and scientific experts, the following findings were generated:

i) Transactions

All three of Commons' transactions – bargaining, managerial and rationing – were identified, in various frequencies and intensities:

a. Users engage in bargaining transactions with island officials of all administrative levels to extend deadlines and obtain access to information but also, interestingly, to expand water management practices on the islands (through, for example, the proposal by an agricultural association for the use of treated water for agricultural purposes).

b. Island officials bargain within island agencies for assistance regarding specification and interpretation of the numerous laws they have to implement.

c. Island officials often resort to commanding legally inferior officials – thus engaging in managerial transactions – as a way of ensuring that they can pursue their method of water management for the islands. Central officials, situated at a higher level, do the same with island officials.

d. Mostly though, island officials are constantly attempting to engage in rationing transactions with officials in Athens, either trying to influence the crafting of policies or their implementation on the islands. At present, these attempts have not yet been successful.

e. Inducing transactions, the durable change of behaviour through the breaking of old habits and the taking of new ones were the transactions most desired and sought after, mostly by actors at the island level. Water users wanted to induce changes in the behaviour of the island officials, who in turn wanted to induce change in the behaviour of central officials and water users alike. However, no inducing transactions were actually observed, as they require one authoritative agent to guide the habit-breaking process. The agents that most desired a change in the habits of others were the ones with the least power to see such a process through.

f) Various actors attempt to influence the natural component of the water sector, thus effectuate change in it. Grass-roots activists in Tinos are creating slow streams where water can flow slowly, allowing it to filtrate into the soil and enriching the aquifer, thereby meliorating the pressure on the groundwater. The Agricultural Association of Syros sent proposals to officials requesting the re-use of treated water for agricultural purposes, thereby attempting to reorder and re-structure the water sector on Syros. Without economic and institutional support from local and national authorities, these attempts are futile and will not bring about a durable or meaningful change. Most of the transactions occur between highly interdependent activities, are characterized by low modularity and high functional interdependence of process. Low modularity means that the actors (and transactions) cannot effectuate change without interaction with others. They also operate within a high-functional interdependent system, meaning that changes in one part of the system significantly affect other parts of it. The combination of these two characteristics leads to *complex-interconnected transactions.* A structural change is needed if meaningful change is to occur. Willingness of key actors to commit and interact with others operating in different levels and jurisdictions need to be cultivated and trust between officials (in islands and in Athens) and waters needs to be built.

ii) Remedial Power and Beliefs

Officials appear to exercise their remedial power motivated by what they believe is in the island's and their fellow citizens' best interests. Both users and officials have a deep mistrust towards the central government in Athens, especially regarding its intentions and dedication towards the islanders. This mistrust manifests itself in the continual efforts of users and officials alike to gain sovereignty of control over their water. Users, for example, will avoid declaring their wells for as long as possible, in fear that they would then be called upon to pay a fee for them to the state. Officials try to protect citizens from what they believe to be an over-interventionist central government that does not understand or care about them or the islands and that only views them as a source of taxes. These local officials are further split into two categories: a) those positioning themselves on the citizens' side and trying to supply as much filtered useful information as possible to them. These are the officials who believe what they do is a leitoúrgima, meaning a service to the public; and b) officials who believe that it is not enough to offer legal guidance to citizens but that one should start by changing the working rules facing them; therefore, they try to influence policies by sending proposals and suggestions to Athens.

The dysfunction of the water sector in the Cyclades has, in a way, become a self-fulfilling prophecy, as the same apparatus that has created and sustained the dysfunction is called upon to rectify it. I have identified a deep mistrust that cuts through all administrative levels and main actors, characterised by a one-way, top-down communication style within agencies that does not allow for input from the island level, where officials are much more knowledgeable of local conditions, problems and opportunities and could, furthermore, call upon support from the local population. The more the island level is not given voice and an active role in the decision-making process, the deeper and more chronic this distrust tends to grow, and the more difficult eventual rectification of the water sector becomes.

Based on the results of the foregoing research, I can now assert with certainty that the water sector in the Cyclades is dysfunctional

because

Decisions made on how to manage it are made in distant decision-making centres by officials in Athens;

because

Island officials, who are knowledgeable and have an immediate interest in rectifying the water sector, cannot successfully engage in the transactions they want to;

because

The island administration does not have the autonomy to do so;

because

Despite proclaimed attempts at decentralisation, the central administration in Athens still retains all policy-making and decision-making powers.

These findings may have significant policy implications. Breaking the vicious circle sketched out here will require that the administrative levels most familiar with local conditions should be given more power to decide on how to best govern their water resources. Granting a substantial degree of administrative autonomy and sovereignty to the Cyclades islands – thus empowering island officials to act upon their beliefs, to plan, design and implement policies, to take charge of their own budget allocation – will have cascading positive effects.

As outlined here, islanders tend to trust local officials because they have frequent encounters with them on a regular basis. Unlike those in the central administration these local officials are not seen as impersonal law enforcers but, rather, as neighbours, customers, parents, sometimes also relatives. When grievances and problems arise, they are ready to discuss and resolve them.

Most importantly, island officials are islanders as well. They reside on the islands, where they too face water shortages, they too experience the particular taste of desalinated water and they too pay higher than necessary water bills. They are exposed to many of the same hardships as other citizens. Consequently, island officials have many reasons to wish for the water sector in the Cyclades to be rectified. Unfortunately, at present, they have no administrative means with which to fulfil their wish.

Empowering island officials administratively is likely to be the most plausible way of rectifying the water sector in the Cyclades.

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# Appendix

## Appendix 1: Project Information Sheet

**Research Project:** The Water Crisis in the Greek Island Complex of Cyclades: Diagnosis, Analysis and Rectification**.**

M.Sc Ourania Papasozomenou, Humboldt University of Berlin; Faculty of Agriculture and Horticulture, Division of Resource Economics, Philippstr. 13, Hause 12, 10099 Berlin.
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**INFORMATION FOR INTERVIEW PARTICIPANTS**

The research project aims at understanding and analysis the water crisis in the Cyclades. It is based on social and political science and the analysis is based on two pillars: a) in the suitability of the current institutional setup, and b) in the practical implementation of the legal framework. As a result of the research project policy recommendation will be presented, aiming at improving the water sector in the Cyclades.

The method of qualitative interviews was selected as the best suited for collecting information needed. This method allows the collection of personal experiences, beliefs and views of those directly involved in the design and implementation of water policies, as well as water users.

Participating in the interviews is voluntary and requires the written consent of the interviewees. As an interviewee you are encouraged to ask the researcher regarding the research project, its aims and its results, the interview process, your role in in the project etc. You have the possibility to decline to reply to any question and/or give comments during the interview.

The interview will be arranged at place and time that is convenient for you and is expected to last less than 1.5 hours. During the interview the following topics will be discussed: 1) current state of water resources in the Cycladic islands and the reasons thereof; 2) measure to improve the state of water resources; 3) legal framework for dealing with the crisis and 4) examples of implementation. With your consent, the researcher would like to record the interview.

Data obtained during the interview will be processed, analyses and used in academic publications. All information is confidential based on scientific ethics. Interviewee's anonymity will be treated with utmost discretion. Any information with might help to identify the interviewees will be concealed. Only the researcher will have access to the audio files and their transcriptions, which will be deleted upon completion of this research project.

Results of this project will be published in a monograph dissertation and can as well appear in several academic articles published in international scientific journals. The researcher will be able to provide all publications to the interviewees if they so wish.

Thank you for your time,
Ourania Papasozomenou

**Appendix 2: Informed Consent Form**

**Research Project**

The Water Crisis in the Greek Island Complex of Cyclades: Diagnosis, Analysis and Rectification.

M.Sc Ourania Papasozomenou, Humboldt University of Berlin; Faculty of Agriculture and Horticulture, Division of Resource Economics, Philippstr. 13, Hause 12, 10099 Berlin.
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**INFORMED CONSENT FORM**

1. I confirm that I have read and understood the information for interview participants. ☐

2. I understand that my participation is voluntary and that I am free to decline replying to any question or giving comments without giving any reason. ☐

3. I understand that the interview will be recorded and I consent to it. ☐

4. I understand that all information will remain confidential, according to scientific ethics and that my anonymity will be secured. ☐

5. I consent to the use of anonymous direct quotes from my interview in publications and presentations based on this research project. ☐

6. I agree to take part in the above mentioned research project. ☐

| Name of participant | Signature | Date |
|---|---|---|
| Researcher | Signature | Date |

## Appendix 3: Interviews Cited

| Interview number | Capacity of Interviewee | Level | Time of interview |
|---|---|---|---|
| 1 | Elected Official at the Prefecture of South Aegean | Syros | May 2014 |
| 2 | Official at Devolved Administration | Syros | December 2014 |
| 3 | Official at the Municiapity of Tinos | Tinos | December 2014 |
| 4 | Official at Devolved Administration | Syros | July 2013 |
| 5 | Official at the Prefecture of South Aegean | Syros | May 2014 |
| 6 | Official at the Special Secretariat of Water | Athens | May 2014 |
| 7 | Official at the Prefecture of South Aegean | Syros | May 2014 |
| 8 | Hotel Owner | Syros | May 2014 |
| 9 | Representative of the Agricultural Association of Syros | Syros | May 2014 |
| 10 | Domestic User | Tinos | May 2014 |
| 11 | Domestic User | Tinos | December 2014 |
| 12 | Expert: Hydrologist specialising in the Cyclades | Athens | December 2014 |
| 13 | Domestic User | Syros | May 2014 |
| 14 | Elected Official in the Municipality of Tinos | Tinos | May 2014 |
| 15 | Official at the Ministry of Agriculture | Athens | May 2014 |
| 16 | Official at the Municipal Company of Water and Drainage, Syros | Syros | December 2014 |
| 17 | Official at the Municiaplity of Tinos | Tinos | May 2014 |
| 18 | Official at the Prefecture of South Aegean | Syros | December 2014 |
| 19 | Elected Official at the Municipality of Tinos | Tinos | December 2014 |
| 20 | Citizens‘ Initiative Tinos | Tinos | December 2014 |

*Source*: compiled by author